Dodge's Geography of
Michigan.

By Mark Jefferson.

DODGE'S GEOGRAPHY OF MICHIGAN

By

MARK JEFFERSON

Professor of Geography, the Michigan State Normal College, Ypsilanti, Michigan

Part I

MICHIGAN AS A WHOLE

Part II

THE GROWTH AND DEVELOPMENT OF CITIES

Part III

STATISTICS AND AIDS TO TEACHERS

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THE INTRODUCTION

HOME Geography is usually the first work to be taken up in any study of geography because beginning students need to know first the geography of the locality in which they live, in which they are most interested, and with which they are most familiar from personal experience. The results gained from a study of the region they can see gives them the ability to understand remote regions that can only be pictured or described to them. Because our own home locality is of most interest to us is also a reason why we need to know it better than we need to know any other region of the world. Hence at some time during the school course it is most valuable to make a careful study of the state or group of states in which we live that we may have a better understanding of the geography about us than we can get from the necessarily brief accounts given in a text-book of geography.

In a text-book of geography we study the relation of one state or group of states to the whole country of which our home region is a part, and our commercial relations to the world as a whole. It follows that in such a treatment the characteristics that distinguish our own home regions must largely be lost to sight in the consideration of the great features that distinguish the country as a whole.

In a special text-book devoted to one state or group of states we can learn more about our own region, its important surface features, its climate, the occupations of its people, its products, its local commerce, its history, its chief cities, and many other features of great interest to us. Hence we need to make a special study of our home locality after we have studied the larger region of which it is an important part. A local geography is not only valuable for study in school that we may know well the region about us, but it is valuable also as a reference volume to which we can refer for facts about our own state in our homes whenever in our reading or conversation some question arises concerning our own state which needs to be answered at once.

In this text-book the surface features, the climate, the soil and other natural resources which determine the occupations of the people are studied first because they are the large atures which determine the distribution and success of industries. One of the great lessons student learns in geography is Man's absolute dependence upon Nature for his existence. is state, as in other regions, topography and climate pointed out the path of development mmunities must follow in order to make sure their existence within its borders. In the pa at follow, the student finds traced the fundamental conditions that have moulded the t state. After these come the historical events that are landmarks in its growth, and tudy of the industrial and commercial features is taken up. To these, which explain t asons for the development and growth of the larger cities, and which show us why our own region is important to the country as a whole, careful attention has been given.

Certain facts like the distribution and character of educational institutions, the distribution of congressional districts, and the form of government in the region are included, because our knowledge of our own locality would be incomplete without them. These fittingly illustrate the political unity that binds together the interests of all the individuals who form the body-politic which we call the state.

That this book may prove especially valuable as a reference work which may properly be made a part of the family library for constant consultation on many points, carefully prepared diagrams, tables of statistics, and references to further reading have been included.

RICHARD ELWOOD DODGE.

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Giant's Stairway and Fairy Arch, Mackinac Island.

THE GEOGRAPHY OF MICHIGAN

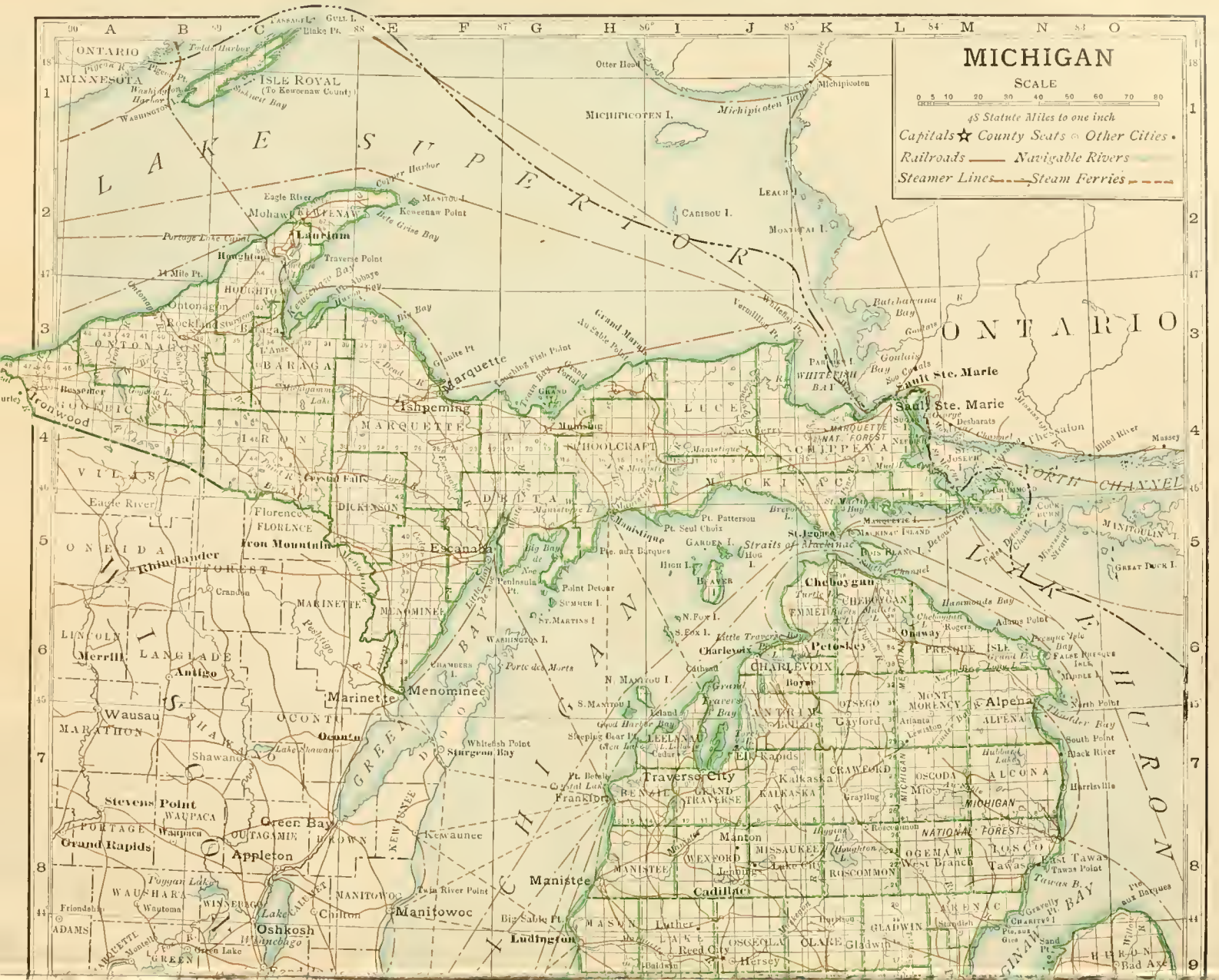
By Mark Jefferson, *Professor of Geography, the Michigan State Normal College, Ypsilanti, Michigan.*

I. MICHIGAN AS A WHOLE

Michigan is a large state, with great natural resources, likely in the future to support a population little inferior to that of the largest state. (Fig. 2.) In a new country like ours, the near places are first occupied, the easiest things first done. It is for this reason and the great importance that contact with Europe has had for us in the past that the states of the Atlantic seaboard have proceeded so much farther in developing their resources than the newer communities of the West. There are today eighteen states larger than Michigan, but most of them are west of the 100th meridian, and many of them are limited for human occupancy by scanty rainfall. (Adv. Geog., Fig. 188.) In parts of our state the rainfall is light, but everywhere it is sufficient for successful agriculture. (Fig. 19.) Though lying far to the north, the lakes diminish the rigor of an interior climate, yet it is in that invigorating zone of spells of weather, now hot, now cold, now wet, now dry, in which are found the most prosperous and progressive peoples, the whole world over. (Adv. Geog., Fig. 74.)

Fig. 1. *Distribution of hard old rocks of the mining country and flat rocks of the farm region.*

Surface and Drainage. The Great Lakes region, of which Michigan forms a part, has very different characters in the north and south. (Fig. 1.) The forested north abounds in game, but thin soil, among innumerable rocky knobs (Figs. 3 and 4), discourages human settlement. Were it not for the valuable ores found in its rocks it might be still a wilderness. This is the land of mining (Fig. 16), of lumbering (Fig. 45), and of hunting and summer vacation outings. Farther south a deeper soil cloaks the ledges and permits an agriculture that attracts a great population. The maps showing distribution of population (Fig. 51) and of farm and forest products show the subdivision of the region very plainly. (Figs. 21, 27, 29, 30, 31, 32, 33, 34, and 45.) The


MICHIGAN
SCALE
0 5 10 20 30 40 50 60 70 80
45 Statute Miles to one inch
Capitals ☆ County Seats ○ Other Cities •
Railroads —— Navigable Rivers
Steamer Lines ——— Steam Ferries
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
ONTARIO
MINNESOTA
ISLE ROYAL
(To Keweenaw County)
MICHIPICOTEN I.
CARIBOU I.
Otter Head
Michipicoten
Eagle River
Mohawk
KEWEENAW
Keweenaw Point
Copper Harbor
Laurium
Houghton
Portage Lake Canal
Traverse Point
Keweenaw Bay
HOUGHTON
Ontonagon
ONTONAGON
BARAGA
Rockland
Sturgeon R.
Big Bay
Marquette
Grand Marais
Au Sable Point
Grand Portal Point
Granite Pt.
Vermilion Pt.
Batchawana Bay
Gaudeau
Gaudeau Bay
Sault Ste. Marie
Ste. Marie
Desbarats
Ste. Joseph I.
Mission
Bellevue
Massey
Bessemer
Ironwood
Ishpeming
MARQUETTE
Munising
SCHOOLCRAFT
CHIPPEWA
LUCE
MACKINAC
Manistique
Pt. Patterson
Pt. Seul Choix
Pic. aux Barques
Garden I.
Straits of Mackinac
St. Ignace
Mackinac Island
Marquette I.
Bois Blanc I.
Brevoort L.
Cheboygan
CHEBOYGAN
EMMET
Onaway
Hammonds Bay
Rogers
Adams Point
Petoskey
Charlevoix
CHARLEVOIX
Little Traverse Bay
Bay View
PRESQUE ISLE
Presque Isle Bay
Grand Lake
Lewis
FALSE PRESQUE ISLE
Middle I.
North Point
Alpena
ALPENA
Thunder Bay
South Point
Black River
Harrisville
Escanaba
Peninsula Pt.
Point Detour
Summer I.
St. Martins I.
Big Bay de Nocquet
Little Bay de Noc
Florence
FLORENCE
Iron Mountain
DICKINSON
Eagle River
Crandon
Rhinelander
FOREST
ONEIDA
VILAS
MARINETTE
MENOMINEE
Peshtigo
Merrill
LINCOLN
LANGLADE
Antigo
Wausau
MARATHON
Marinette
Menominee
Oconto
OCONTO
Shawano
Lake Shawano
Whitefish Point
Sturgeon Bay
Washington I.
Chambers I.
Porte des Morts
Green Bay
GREEN BAY
N. Manitou I.
S. Manitou I.
Sleeping Bear Pt.
Glen Lake
LEELANAU
Good Harbor Bay
Grand Traverse Bay
Traverse City
Pt. Betsie
Crystal Lake
Frankfort
BENZIE
GRAND TRAVERSE
Elk Rapids
Kalkaska
CRAWFORD
Grayling
OSCODA
ALCONA
Hubbard Lake
MICHIGAN NATIONAL FOREST
Roscommon
Houghton L.
Manton
WEXFORD
MISSAUKEE
Lake City
ROSCOMMON
OGEMAW
West Branch
ROSCO
East Tawas
Tawas Point
Tawas B.
Stevens Point
WAUPACA
Waupaca
PORTAGE
Grand Rapids
OUTAGAMIE
BROWN
Kewaunee
Appleton
Green Bay
Poygan Lake
WAUSHARA
Wautoma
WINNEBAGO
Lake Winnebago
Oshkosh
Omro
Green Lake
GREEN
ADAMS
Friendship
Manitowoc
MANITOWOC
Twin River Point
Chilton
Manistee
MANISTEE
Cadillac
Big Sable Pt.
Ludington
MASON
Luther
Lake
Reed City
OSCEOLA
Hersey
Baldwin
CLARE
Gladwin
IOSCO
Sturgeon
Pte. aux Gres
Sand Pt.
Charity I.
Gravelly Pt.
Pte. aux Dakues
HURON
Bad Axe

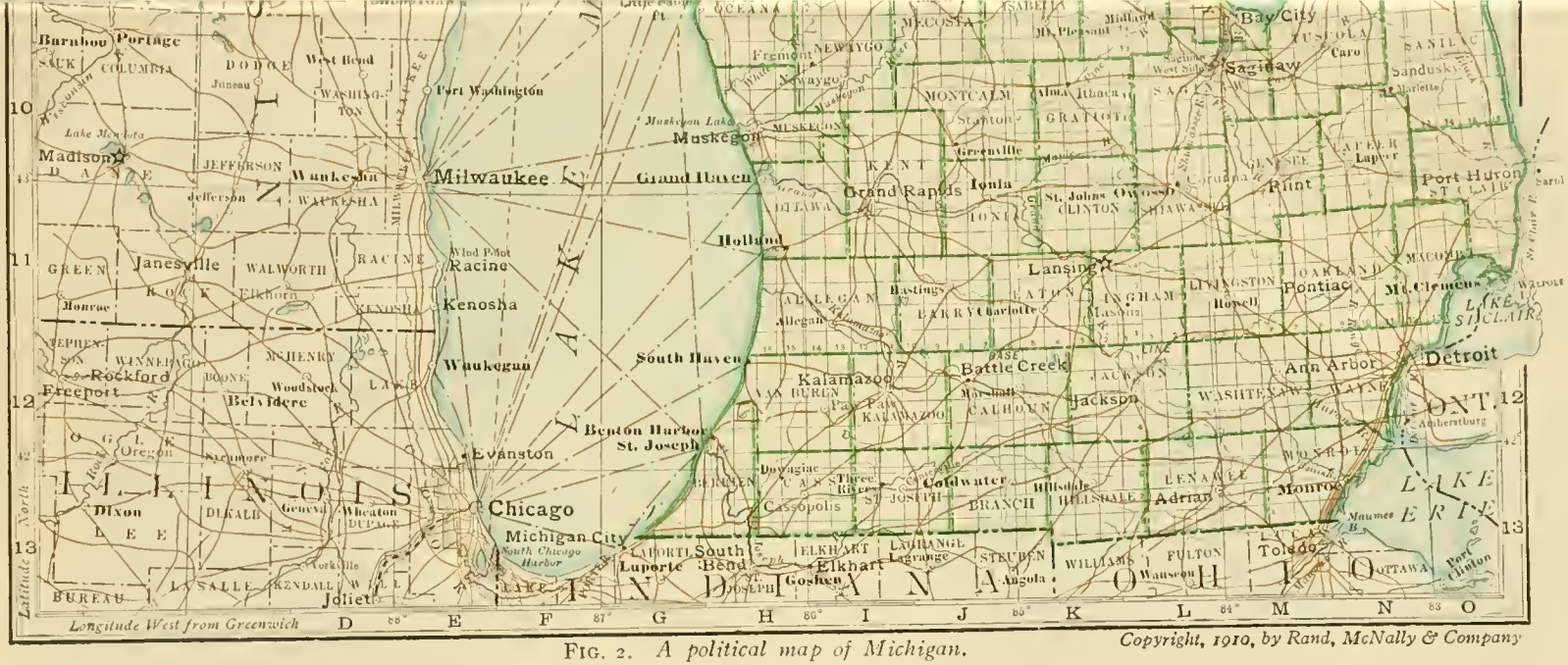


FIG. 2. *A political map of Michigan.*

southern soil cover has largely resulted from the stripping of the looser decayed parts of the northern ledges, as appears from the abundance of bits of northern rock from them in the southern soils, including the field stones scattered over the surface and so effectively used throughout the southern area for building purposes. Indeed if you take up a handful of dirt almost anywhere in southern Michigan, it is probable that most of it came from the north. It is noticed that Wisconsin and Ontario (Fig. 6) share this twofold character with Michigan. Under the deep southern soils are other rocks of a very different character; sandstones, limestones, or shales mostly, with layers of coal here and there in one part of the region, and some of rock-salt and gypsum, but all orderly and flat-lying, like the leaves of a book. In the north such rocks are unknown or of little extent. The rocks there are hard and old, often crystalline, or, if in layers, the layers are bent, twisted, and crumpled. (Fig. 5.) The crystalline ones may be known by the little grains of differing color and shape that make them up, but without orderly arrangement. A granite is crystalline or the field stones of all Michigan are examples. It is altogether likely that these old, hard rocks extend southward under the covering layers of flat-lying, southern rocks. The irregularity and twisted condition of the northern ledges brings it about that the harder parts, the parts that have best withstood the long continued action of the weather, are very strangely scattered about. (Fig. 5.) Irregularity is as striking in the landscape as in the rock that makes it up. Many of the northern rivers tumble over rocky ledges

in waterfalls of much beauty. It is in these old rocks that the ores of iron and copper occur in veins, seams, and pockets. They have been deeply buried in the past, and it now has become possible to get at them near the surface, because so much of the upper part of the ledges has been worn off. (Fig. 8.) When the veins are followed, however, they lead the shafts sometimes a mile down into the ground, as in some of the great copper mines. Because of the coating of drift or soft ground rock from the north, the ledges of the southern area are little seen. They nowhere make hills above the surface like those so common in the north, but must be looked for in the beds of rivers, or at the shores of the lakes where running water or the waves have bared them. (Fig. 9.) Rarely do they come near enough the surface of the country to be quarried from above, as at Trenton and Maybee in the southeastern part of the state,

FIG. 3. *Street in Negaunee where ledges of rock occur everywhere. In this respect the north is like New England.*

and in larger areas near Alpena. At the northern end of the Thumb (Figs. 2 and 10) and about Grand Traverse Bay (Fig. 11), they form cliffs that rise from the water to a considerable height.

There are hills and ridges in the southern region, but not of rock. These are masses of clay, sand, or gravel, left somewhat irregularly on the country by the melting of the ice sheets that had moved slowly from the northern area with quantities of the softer rock fragments they had been able to scrape off from there imbedded in their lower layers. In the hollows among these hills and ridges lie the innumerable lakelets that dot the surface of the lower peninsula. (Fig. 2.) The curious backward fashion in which the Cass and Tittabawassee rivers join the Saginaw (Fig. 12) is due to the presence of low ridges of this nature running about parallel to the shores of Saginaw Bay. The same thing is seen in the way the Maumee

FIG. 4. *Rocky hill near Marquette. This is a knob of greenstone schist.*

in northeastern Indiana receives its tributaries, the St. Marys and the St. Joseph. (Fig. 12 and Adv. Geog., Fig. 252.) The present Great Lakes did not exist before the glaciers came over this region. They began their existence when the ice sheets first melted back from the moraine ridges. At first they had for their northern shores the ice itself, melting back slowly as the air grew warmer, and the level of the lakes changed as the water escaped by lower and lower notches in the morainic rim. Many beaches of these older Great Lakes are found throughout the state, and the ancient outlets are still plain to see, though now without water. In them are the easy portages between neighboring drainage basins (Fig. 13), the natural location for growing towns, of which Fort Wayne (No. 4) and Chicago (No. 2) are good examples. Towns named Portage now stand in two of these outlets (No. 1) in Wisconsin and (No. 5) in Ohio (Fig. 13). New York has grown because of the Oswego-Albany outlet across the Alleghenies, the only low passage from the interior to the Atlantic seaboard. (Adv. Geog., Fig. 189.)

The St. Lawrence passage is dangerous and icebound in winter. All but a tiny patch of the Northern Peninsula of Michigan drains to the St. Lawrence, as the drainage map shows. (Fig. 13.) The point where the divide is nearest the lakes, except on the high land along Lake Erie, is at Chicago, in the line of one of the largest of these old outlets. This was early found to be the easiest portage to the Mississippi, and Chicago owes the beginnings of its growth to that fact. Nicollet, who founded the settlement at Sault Ste. Marie in 1635 (Fig. 15), came to the lakes by the Ottawa River, making a portage (Fig. 14) to Lake Nipissing on the 80th meridian a little north of the 46th parallel. (No. 6, Fig. 13.) This was also Marquette's route and that of all the earlier French explorers, as the route by Lake Erie was not known for many years, lying in the territory of the warlike Hurons. It is for this reason and the divergence at Mackinac of the routes to Lake Superior in the north and the Mississippi in the south that Mackinac Island was so important in the early days.

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FIG. 5. *A view of Negaunee dike from on top.*

Courtesy Pass. Dept., G. T. R. W.

FIG. 6. *Scene in North Channel near Killarney, Canada, among the 30,000 islands of Georgian Bay*

Climate. The temperature of the country about the Great Lakes is affected by the temperature of the lakes, especially within a mile or two of their shores. The

water temperature varies greatly with their depth. Almost a third of Lake Superior has its bottom below the level of the sea, the surface being 602 feet above. (Fig. 7.) The water in these depths is always cold, almost down to freezing, as is the water in the depths of northern Lake Huron and Lake Michigan, the northern half of each being the deeper. (Fig. 7.) It often happens on the south shore of Lake Superior in summer that the wind blows from the land out over the lake. At such times the water near shore at once becomes very cold. Bathers on all the lakes notice this with offshore winds. The wind has pushed the surface water before it out into the lake and bottom water has come up to take its place. In each of the lakes, too, the surface water is much colder over the deeper places than elsewhere, notably out in the depths of Lake Superior; but also in the northern part of Lake Michigan, where a "cold island" of surface water is so well known to masters of vessels that they make a practice of taking their drinking water there. (Fig. 7.)

As the winds often blow from the lakes to the shore, summer heats near the deep lakes are much reduced by the low temperature of the water, while the lowest possible temperature of winter water is 32 degrees, much above the temperatures that prevail on shore at that season. Even shallow lakes like St. Clair do not heat up in the summer sun like the neighboring land. Water uses much of the heat that comes to it for evaporation, and does not heat up so readily as solids do. The result is that all the lakes tend to stay at one temperature the year round, and the shores have an evener and a more temperate climate than places farther back. The maps of a hot summer day and a cold winter day on the lakes show the extreme temperatures of their season all over this part of the country. (Figs. 17 and 18.) It is seen that the lake shores are least affected. As the winds prevail from the west, easterly shores are milder than western ones.

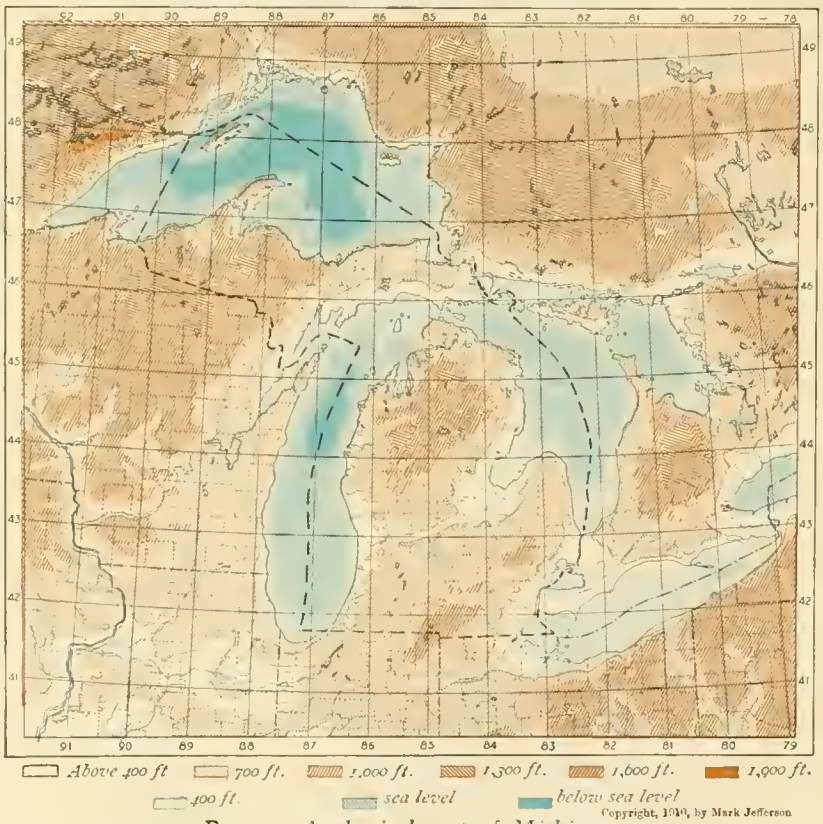

FIG. 7. *A physical map of Michigan.*

Though Michigan lies on the border of the well-watered part of the United States, it has everywhere sufficient rainfall for successful agriculture. (Adv. Geog., Fig. 188.) The average rainfall is about thirty-five inches (Fig. 19), heavier to the south and in patches east of the lakes. An examination of the relief map (Fig. 7) will show that where the

FIG. 8. *A view of Aurora Mine at Ironwood.*

west winds blow from the lakes on high ground the rainfall is greater. See in the Grand Traverse region and in southern Ontario. There is a little more rain in summer than in winter, but wet spells of a few days' duration occur throughout the year. The winds that bring the rain are mostly the southeasterly and southerly ones from the Atlantic and Gulf of Mexico.

Agriculture. The climate of Michigan is particularly favorable for the growth of sugar beets and small fruits. Sugar beets are a very important crop, only Colorado and California of our states leading Michigan in this industry. (Figs. 20 and 22.) The chief center of production here is in the Saginaw Valley, a little to the north of the grain region. (Fig. 21.) The state has sixteen factories, which produced 76,000 tons of beet sugar in 1908. (Fig. 22.) Formerly all the sugar of the world was made from sugar cane, which will only grow in the tropics. In 1852 the world's production of sugar included less than 200,000 tons made from beets. In 1903 6,000,000 tons were beet sugar in a total of 10,500,000. The reason for this change is to be found in the fact that in the tropics it is difficult to carry on industrial establishments with success because of the inefficiency and want of energy of the laborers. This makes their labor, though cheap in money, really very costly. Coal is also wanting in most cane-growing countries. The difficulty is industrial rather than agricultural. Michigan built her first sugar factory in 1897, and the results attained are doubtless only the beginnings of larger things in the future. It may be that the western counties, tempered by winds that prevail from Lake Michigan, will prove most suitable for this culture. The beet is said to require a summer temperature of 70 degrees. California has its summer similarly tempered by winds from the Pacific, which enable it to escape late spring frosts. It is doubtless due to these west winds and their moist air that the southwest counties have come to be known as the fruit belt of the

FIG. 9. *Rock Falls, near Harbor Beach.*

FIG. 10 *View of Point aux Barques, Lake Huron.*

state. Prominent among them are Allegan, Berrien, Kent, Ottawa, and Van Buren (Fig. 2), which produce among them nearly two-thirds of the fruit raised in the state, except apples, which are raised everywhere. (Fig. 23.) Michigan produced more than 4,000,000 bushels of strawberries, blackberries, raspberries, peaches, pears, plums, and cherries in 1902. More than two and one-half million of these were raised in the five counties named, and thirty of the thirty-four million pounds of grapes. (Figs. 23 and 24.) Not merely do the lake winds by their warmth prevent frosts in May, but they also temper the March warm spells so that buds do not swell too early. (Fig. 25.) Lake Michigan here literally blows hot and cold, or rather warm and cool, the fact being that the lake water changes less in temperature than the land and so moderates extreme temperatures on shore, either of heat or cold. Apples have not the same sensitiveness to temperature nor have the fruit counties any lead in their production. They grow all over the southern half of the lower peninsula, the crop in 1902 amounting to 11,000,000 bushels. It must be remembered that we are dealing not merely with winds from the lakes, but that most of these winds are westerly and do not benefit shores west of the water. Wisconsin produced in the same year 1,100,000 bushels of apples and 128,000 bushels of strawberries, raspberries, blackberries, currants, and grapes. (Fig. 23.) Comparison with the Michigan figures above show how small this is. Southern Ontario is also a good fruit country, though it is not possible to ascertain the quantities produced. Peaches do well there, but cannot be raised in Wisconsin. There is no reason Ontario should not do as well as Michigan, receiving west winds from Lake Huron just as Michigan does from Lake Michigan. The fact that the international boundary cuts Canada off from the American market undoubtedly hampers all her crops. Chicago markets exercise a strong influence on the Michigan fruit counties, but this alone has not given Michigan her place in fruit raising, for the near parts of Indiana seem to produce little. They doubtless lack the favorable position with regard to the lake. Probably no state but California is so favorably situated as Michigan for fruit raising, and the great and

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FIG. 11. *A view of the cliffs at Petoskey.*

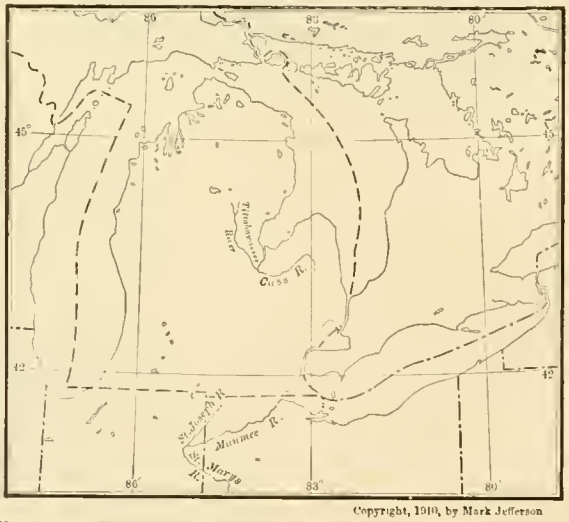

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FIG. 12. *The Cass and Tittabawassee rivers join the Saginaw in backhanded fashion. So do the St. Joseph and St. Marys join the Maumee. Why?*

growing population of the central states seems to guarantee a rapid development of this business in our state. The present need of the industry seems to be a reasonable refrigerator car service.

The forest country of the north is just so much subtracted from the agricultural resources of the state. Yet Michigan is one of the great agricultural states, being thirteenth in the value of products per square mile of total area. The value of the principal farm products in 1903 was more than $100,000,000; in 1908 probably $170,000,000. The great items are hay, corn, wheat, oats, potatoes, and wool.(Part III, Table, p. 46.) In addition to these items are about $10,000,000 worth of poultry and eggs, 468,000,000 pounds of milk, and a large but unreported quantity of meat and the fruit. The beans raised in 1903 were valued at $5,000,000, a quantity not equaled by any other state. In 1909 it had reached nearly $10,000,000. This crop has been increasing very rapidly in Michigan and probably has not reached its fullest development. A product in which the state has long enjoyed preëminence is peppermint. The value of the product is extremely small, however.

The leading cereals are very important to the people of the state, and their production is distributed very much as the population itself is distributed. All of the cereal diagrams (Figs. 27, 32, and 33) should be looked at in connection with the diagrams of population (Figs. 28 and 51). It is seen, as usual, that what is true of southern Michigan is true also of southern Wisconsin and Ontario. Southward the crops increase rapidly, northward they diminish into the rocky forest belt. Thus southern Ontario, the part of the region most inclosed by water, is perhaps the best producer. How sensitive corn is to sunshine is seen in the fact that it rapidly diminishes in abundance when the same latitude is reached all across the area. (Fig. 33.) Wheat is a diminishing crop in the state. (Fig. 27.) The combined cereals are grown in increasing quantity, but the increase is now not large. (Figs. 26 and 35.) The potato crop even invades the forest country, as the plant can endure a severer climate and a poorer soil. (Figs. 34 and 43.) This crop is a steadily increasing one, in

FIG. 13. *St Lawrence drainage and old portage sites.*

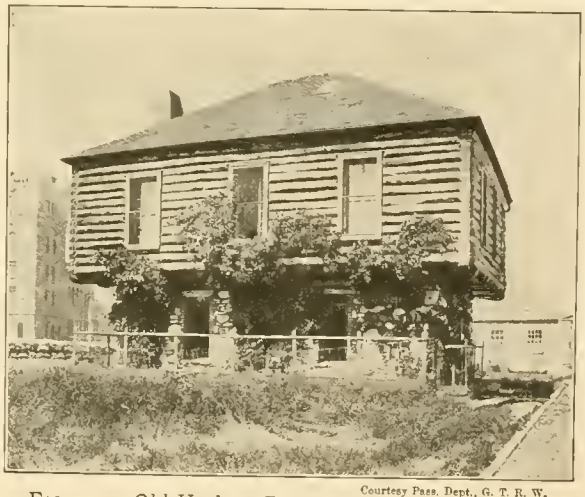
which Michigan is third in the Union. (Part III, Table, p. 46.)

Agriculture is the state's greatest resource. The small yields per acre now obtained in Michigan for all the staple crops seem to hold out great encouragement to intelligent young men to take up farming. Of the 48 states and territories in 1908 no less than 14 obtained more wheat from an acre of ground cultivated than did Michigan; 16 got more corn, 21 more oats, 33 more hay, and no less than 40 more potatoes. Except for hay the New England states always excelled us. So did the Pacific and some of the Rocky Mountain states. The leadership of old hilly states like Maine is of especial interest, for what has been done there may be done here if men set about it. Maine in 1908 raised 26,000,000 bushels of potatoes from 116,000 acres, while Michigan got but 23,400,000 bushels from 325,000 acres. In other words Maine raised 225 bushels to the acre, Michigan 72. Again it is striking that our neighbor, Wisconsin, under almost identical conditions with us gets slightly better yields from all crops. The methods that are applied in other states cannot fail to bring profit to those who apply them here.

Courtesy Pass. Dept., G. T. R. W.

FIG. 14. *On the portage, Temagami Region, Canada. Portage is a French word meaning carry, since when the head of one stream is reached the canoe must be carried over the divide as is seen in the picture. In early days the portages between streams were very important, since all travel passed through them.*

Minerals. Michigan's mines yield about half as much as her farms, $56,000,000 in 1903. Of this $25,000,000 was iron ore and $25,000,000 copper, both from the northern zone of hard rocks and forests. (Figs. 1, 16, and 43.) The copper is practically all in the Keweenaw peninsula that projects from the southern shore of Lake Superior. (Fig. 16.) The backbone of this peninsula is a hilly ridge known as the Copper Range, along which are the great copper mines, of which the Calumet and Hecla is the most famous. The richest of these mines are all on the sites of old mines worked by the Indians. The fact that the Lake Superior copper is native or pure metal, ready to use, made it attractive to barbarous men. Metals are usually obtained in earthy ores that do not at all suggest the useful metal they contain. The process of smelting ores is difficult for uncivilized man; is, in fact, one of the distinctions of civilization.



Courtesy Pass. Dept., G. T. R. W.

FIG. 15. *Old Hudson Bay Post, Sault Ste. Marie.*

The iron ores are found in the higher land a little farther south. (Fig. 16.) These the Indians did not know how to work. This Michigan-Wisconsin region and the Minnesota lands just northwest of Lake Superior constitute the greatest iron region of the whole world.

(Fig. 16.) Michigan was the greatest producer of iron ores in this country till 1902. (Fig. 38.) In 1903 she produced a tenth of all the iron mined in the world. In copper she was first until 1887, and is still mining a sixth of the world's product. (Fig. 40.) She is now third in copper to Montana and Arizona, and in iron second to Minnesota; not that her own production is failing, but because of the great increase in production in those states. Michigan has increased her copper output two and one-half times since 1886, but Montana has increased hers five times. So our state mined nearly twice as much iron in 1907 as she did ten years ago, but Minnesota mined six times as much. It helps to get a conception of the immensity of the Lake Superior iron deposits and their working to note that these two states mined 2,000.000 tons more ore in 1903 than the best other iron region in North America has yielded in all its history. The Minnesota ore has the advantage of lying near the surface in great dirt-like beds so soft that it can be taken out by steam shovels directly into railroad cars as soon as the surface dirt is taken off. Such mining goes fast and is very cheap. At most other mines it is necessary to sink shafts deep into the earth and then blast out the hard ores with much labor. There are still immense quantities of this soft ore in the Minnesota ranges. The quality of the ore, however, is not equal to that of the Michigan ores, as is shown by the fact that the 10,000,000 tons of Michigan ore mined in 1903 were valued at $25,000,000, while the 15,000,000 tons of Minnesota ore were valued at barely $27,000,000.

FIG. 16. *Map showing mineral resources and lines of transportation, 1903.*

No small item in the development of lake ores is the cheap water carriage to the Lake Erie ports near to the coal and limestone of Pennsylvania necessary for their smelting. There are special steamers constructed for this business, with special loading and unloading machinery that enable a large steamer to take or land her cargo in a few hours. (Fig. 39.) The last ten years have seen a cement industry spring up in Michigan that has put the state third in the country. Three million dollars' worth were made in the state in 1903, and the business is increasing under the stimulus of the many uses to which cement is now put. (Fig. 42.) Materials are found in the marls of the innumerable lakelets of the state, and its great limestone deposit (Fig. 16), for an enormous expansion

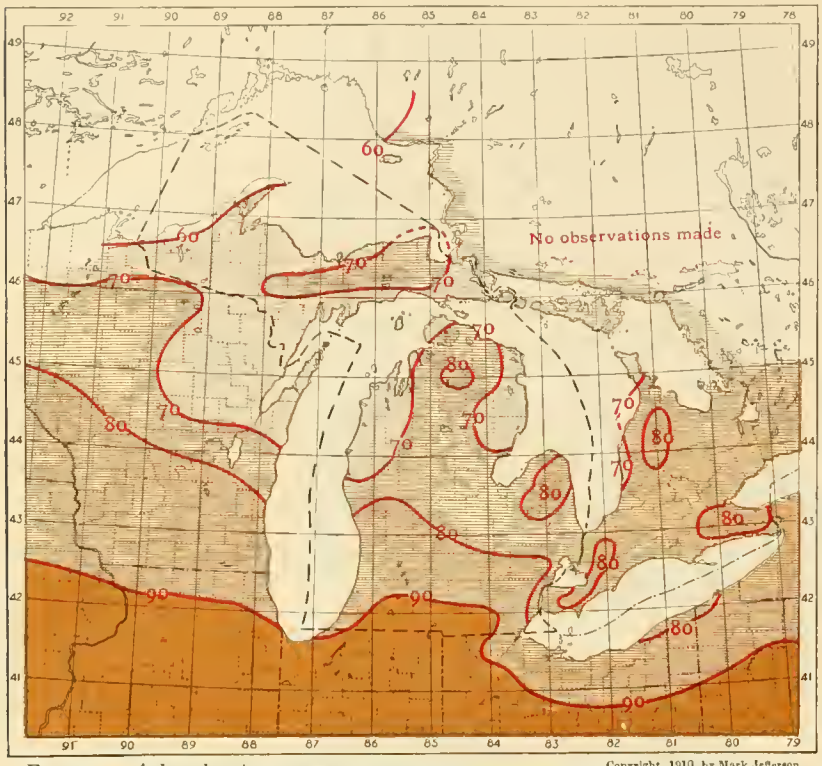


FIG. 17. *A hot day in summer.*

of the product. In salt, too, Michigan was first until 1902, since which time she has been second to New York. The salt is pumped up dissolved in water from the rock-salt layers below. The chief expense of the manufacture is, therefore, the evaporation of this water again. Thus it has come about that lumber mills have come to burn their waste of sawdust and slabs for this work. The price of salt is now so low that the business is hardly more than an economical way of disposing of lumber waste. There was an enormous falling off in the product in the two years 1903 and 1904 in this state, 8,000,000 barrels being made in 1902 against 4,000,000 in 1903, but is now again increasing. (Fig. 46.) Formerly the salt manufacture centered at Saginaw, but the lead has now gone to Ludington and Manistee, just as the lead in lumbering has. Near Detroit a company has sunk a regular mine shaft to the salt and is now quarrying it out in beautiful crystal masses without the expense of evaporation. (Fig. 16.)

The whole central part of the state is underlaid by coal-bearing rocks (Fig. 16), mined mostly in the neighborhood of Saginaw and Bay

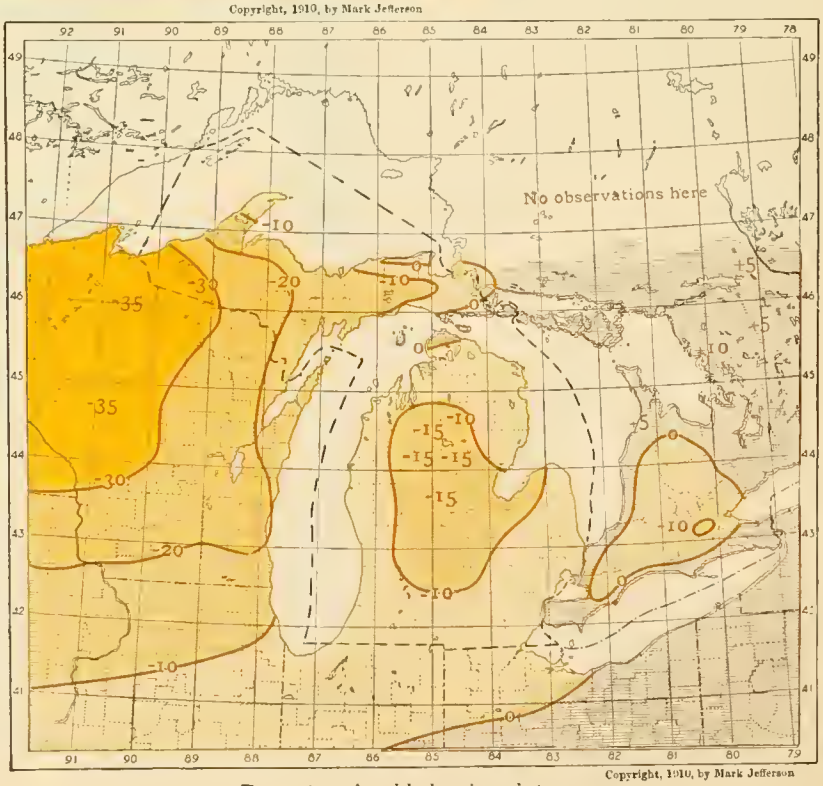


FIG. 18. *A cold day in winter.*

City, where the business has grown as lumbering has declined and left capital seeking investment. In 1895 about 100,000 tons of coal were raised; in 1907, 2,000,000 tons, valued at $3,660,000. The product is increasing enormously. (Fig. 41.) In gypsum, Michigan leads the country with the product of mines near Grand Rapids and at Alabaster near Tawas, but the total value of the output is not large. (Figs. 16 and 44.)

It is evident that Michigan ranks very high as a mining state. (Adv. Geog., Fig. 287.) Agriculture, however, is far more closely associated with the life of her people and more important. The annual hay crop is worth $35,000,000, greater than the yield of either iron or copper. The whole agricultural product is worth much more than the total minerals. The lumber, too (Fig. 45), even in these days of declining output, is worth almost as much as all the yields of the mines, for if the lumber of to-day is inferior its price is high. An excellent relation is said to exist in some of the Lake Superior copper mines, where miners are not uncommonly owners of shares of stock in the mines where they work. This is not usual in mining regions. It is a satisfactory arrangement, since it is a defect of mining industry that it requires large capital to which it often happens that the employees find themselves in antagonism. Part ownership by the men secures their interest in the business. The greatest gain the mines bring to Michigan is one they bring to all the people of the country, greater and cheaper supplies of material needed nowadays by all the citizens.

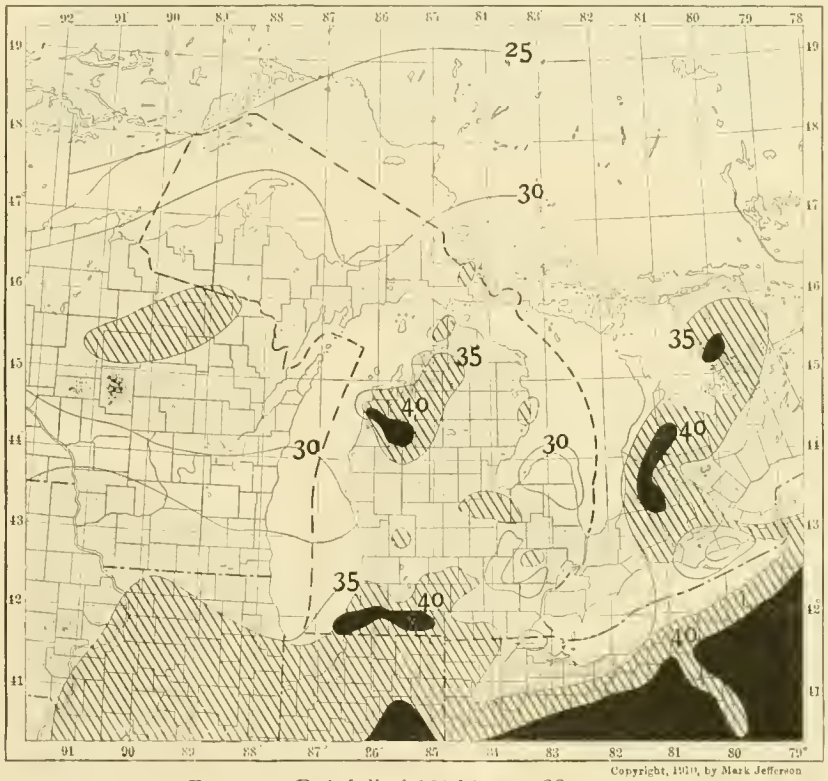


FIG 19. *Rainfall of Michigan, 1880–1904.*

Forests. Anciently the lake country south of 43 degrees 30 minutes was covered by a superb growth of hard wood, while northward from this line stretched the finest forests of pine and mixed growth on the continent. There were splendid trees, hemlocks twelve feet around and white pines thirteen to fifteen, three feet above the ground, rearing their summits sometimes 150 feet in the air. Great groves of solid pine or mingled growths of elm, maple, sycamore, poplar, and hemlock, darkening the soil and keeping it free from undergrowth, alternated with dense growths of tamarack and cedar, which were so tangled as to be difficult to pass through. Now the pine has been cut, probably the DeWard estate in northwestern Crawford County has the only untouched pine woods in the Southern Peninsula. (Fig. 37.) There

From U. S. Dept. Agriculture

FIG. 20. *View of a sugar-beet field near Blissfield.*

is still a great stretch of mixed lumber in southern Cheboygan, eastern Otsego, and western Montmorency counties and also between Marquette and Munising, back from the shore of Lake Superior, from which the little pine it once contained has been culled. This is now being actively lumbered. Over a billion and a half feet of lumber were made in Michigan in 1904, but three-quarters of it was hemlock or hard wood. In 1888, the great year in the Saginaw Valley, over 4,000,000,000 feet were cut and most of it was pine. The last year's product is valued at $54,000,000. Michigan is the second lumbering state in the Union. (Adv. Geog., Fig. 274.) The industry is therefore a vast one. Mills are operating day and night from the Traverse Region around to Cheboygan and Alpena, cutting as much in 1909 as they cut in the greatest year of the business. Although the output is hard wood or hemlock, prices are so high that the value is as good as ever. It is estimated that there is twenty years' cut in sight. The forest map (Fig. 43) shows where the forests are believed to be best to-day. The lumber map (Fig. 45) shows where the largest cuts were made in 1904, and brings out the present lead of Wisconsin and Ontario. It is beginning to be understood that much of the land from which the forest has

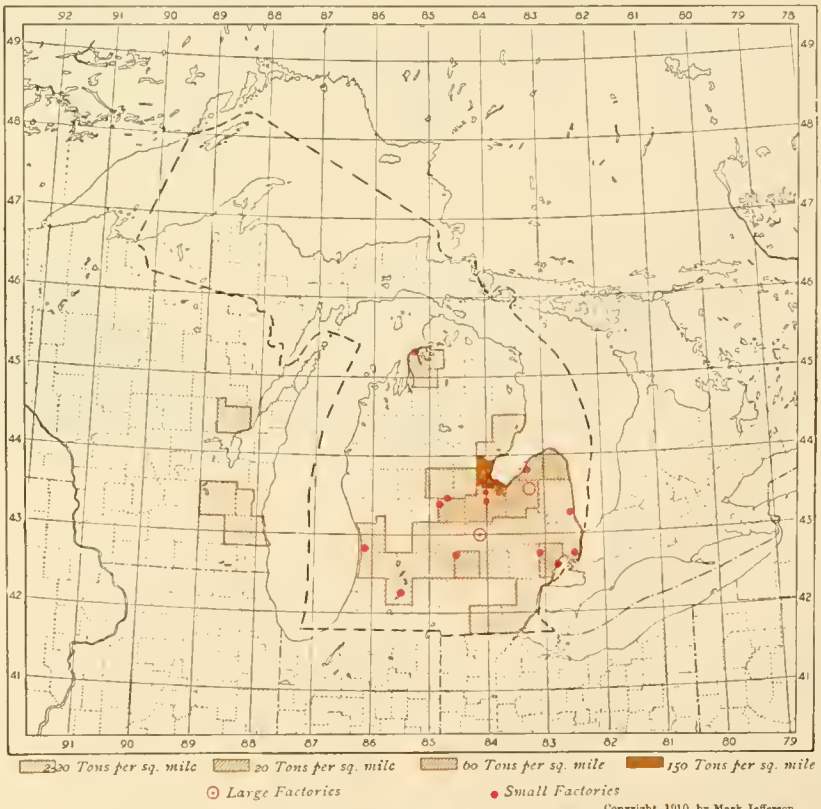


FIG. 21. *Sugar-beet production and factories in 1903. In the five years following, the production of sugar had increased by one-half, but the twenty factories of 1903 were sixteen in 1908.*

been cut is like much land in Europe and the older states, not fit for farming, partly rocky country in the northern peninsula and partly sandy stretches in the northern part of the southern peninsula. Such are perhaps the Jack Pine Plains in Roscommon County. (Fig. 58.) Although lumbering is still carried on there, agriculture is accomplishing as good results as the distance from markets will allow. Yet it will yield a good crop of timber if protected from fire and trespass. Six million acres of such land are in the hands of the state for unpaid taxes. Of this three townships have been set aside under the protection of the State Forestry Commission as the state's first forest reserve. Its place is indicated on the map (Fig. 2).

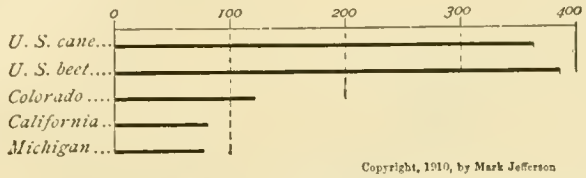


FIG. 22. *The sugar crop of the United States in 1908, in thousands of long tons.*

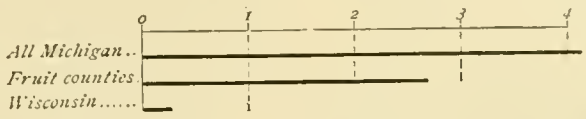


FIG. 23. *The yield of small fruits in 1902, in millions of bushels.*

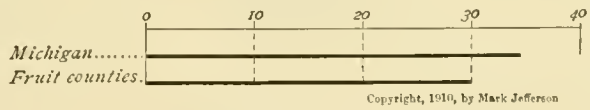


FIG. 24. *The yield of grapes in 1902, in millions of pounds.*

Manufactures. In Michigan, manufactures depend largely on native resources of lumber and minerals. The greatest industry is the lumber and planing-mill products; next comes the foundry and machine-shop output, in which is included Detroit's large business in stoves and furnaces. Flouring mills yield a large product, also copper smelting and the manufacture of carriages, wagons, railway cars, and automobiles. (Part III, Table, p. 47.) Detroit has seen the making of automobiles grow from nothing in 1900 to a sale of 9,000 machines in 1904, a third of the output of the whole country. Lansing and Grand Rapids also have active automobile industries. Lansing is reputed to make more automobiles than any other city of its size in the world. The central position of the state, its abundant raw materials, and many skilled mechanics make the future of the automobile industry in Michigan look very promising The six great manufacturing states of the country are New York, Pennsylvania, Illinois, Massachusetts, Ohio, and New Jersey, after which come five states that differ little among themselves; of these Michigan is one. (Adv. Geog., Fig. 233.) In most of these cases industry is found centered in great groups of population like that at the mouth of the Hudson, which gives New York and New Jersey their leading place. In Michigan, industry is well distributed throughout the state and well diversified everywhere. The four chief industries of Detroit—lumber, iron, chemicals, and vehicles—

FIG. 25. *Scene in a peach orchard near South Haven.*

account for barely a quarter of the whole manufactured output of the city. (Part III, Table, p. 47.) The greater part is the product of a large number of small establishments in a great variety of branches of industry. No state, indeed, produces things more essential to modern civilization or a greater variety of them than Michigan. Detroit is the greatest producer; Grand Rapids, famous through the country for its furniture, comes second; then Kalamazoo, and then Battle Creek, a great producer of threshing machines and breakfast foods. (Part III, Table, p. 47.) But all four together produce a value of only $185,000,000 out of a total for the state of $429,000,000. Industry in Michigan is scattered like the people. It prospers in cities, but thrives here in small cities, where the conditions of life for the employed are often much more desirable than in larger places.

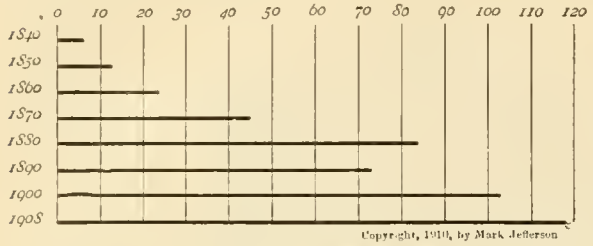


FIG. 26. *The yield of cereals in Michigan for six decades, 1840–1900, and for 1908, in millions of bushels.*

Commerce. On the lakes commerce has reached great proportions. They offer cheap transportation of goods from the producing West to the consuming East. The surface of Lake Superior is eighteen feet higher than Lake Huron or Lake Michigan, causing the rapids in the St. Marys River, known as the Sault (French for rapids) Ste. Marie. (Fig. 49.) Here the early explorers had to land and carry their canoes around the rapids. Here they naturally encamped, and here grew up a fort and trading station of much importance. (Fig. 15.) Great canals, provided with locks to enable vessels to overcome the difference in level, have been built around the rapids on each bank. By the opening of these canals a continuous water route has been established between Duluth and Buffalo, and Minnesota and Dakota grain and Lake Superior iron ores have been rendered

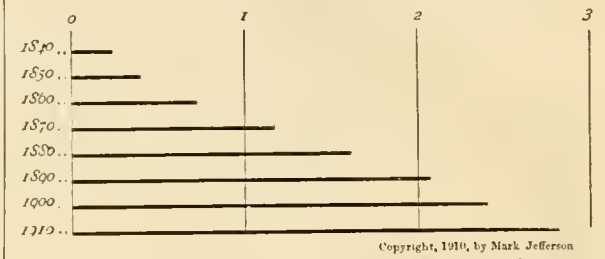


FIG. 28. *The growth of population in Michigan for seven decades, 1840–1910, in millions.*

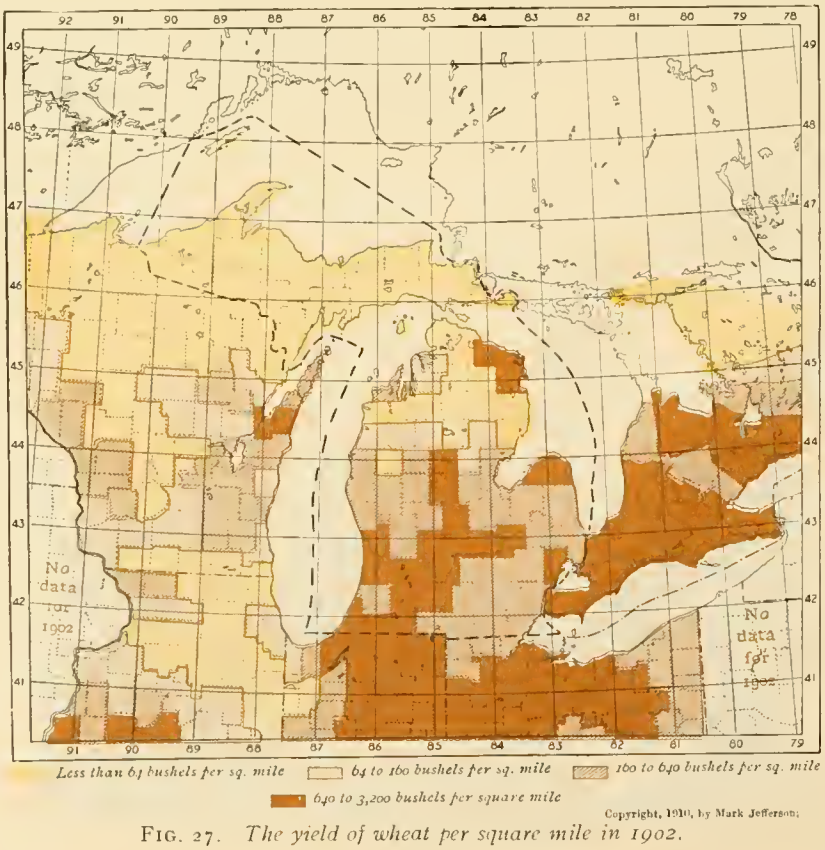


FIG. 27. *The yield of wheat per square mile in 1902.*

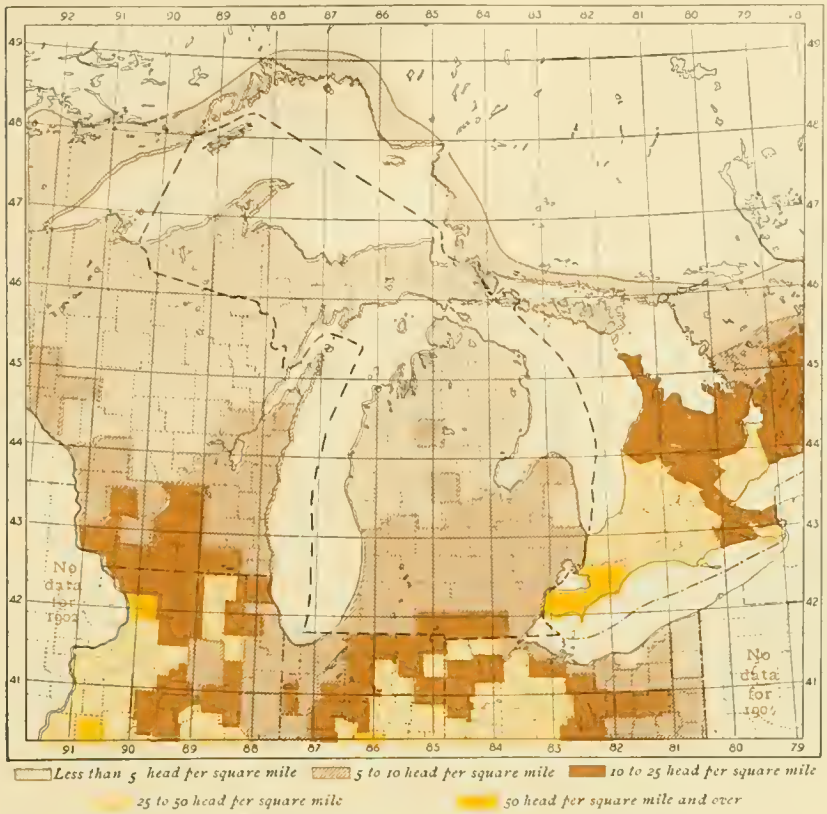


FIG. 29. *Number of hogs per square mile in 1902.*

engineers in the building at the left opened valves in a great number of pipes in the bottom of the lock which allowed the water to run out into the part of the canal below. The steamer was thus gently lowered on the surface of the sinking water until the level of the lower part of the canal was reached. As soon as the gates are wide open she will steam off for Lake Huron or Lake Michigan. Two of these locks on our side and one in Canada have cost $10,000,000.

For nine months each year an enormous traffic passes through these canals, differing but little in bulk from the whole foreign and immensely more valuable. One of the locks at the *Soo* is shown in the picture. (Fig. 64.) It is a part of the canal, 800 feet long and 100 feet wide, fitted with strong, water-tight gates at each end. The upper gates are now closed. The boats above it float at the level of Lake Superior. The gates below are just opening to let the steamer out. Half an hour ago the lower gates were shut and the upper ones open. At that time the water in the lock was as high as in the canal above and in Lake Superior. The vessel then entered the lock and the upper gates were closed behind her. The

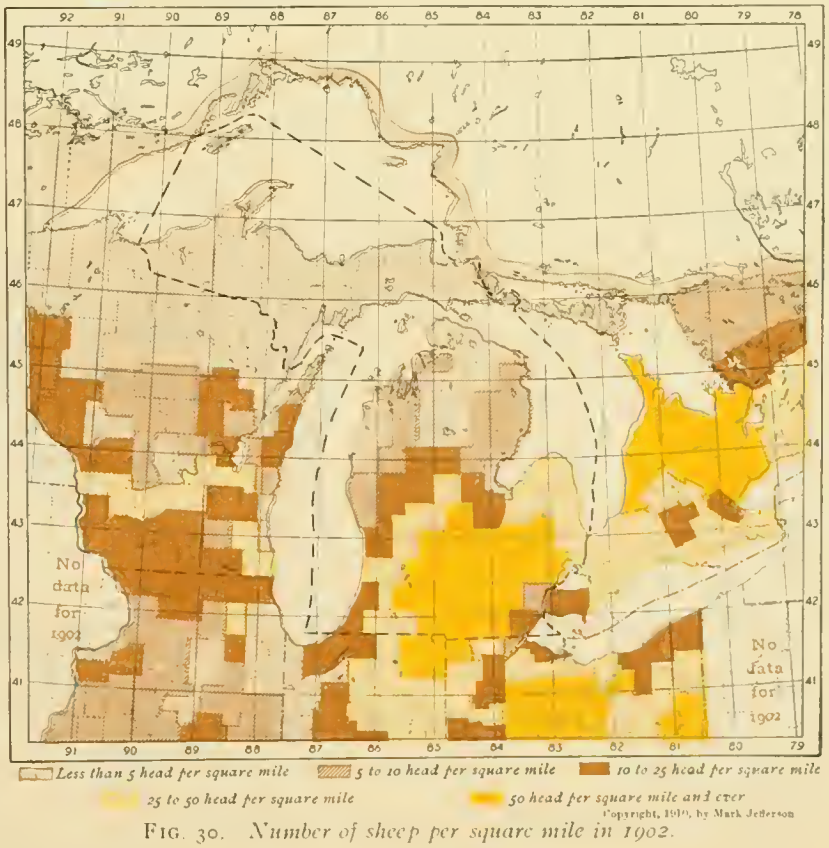


FIG. 30. *Number of sheep per square mile in 1902.*

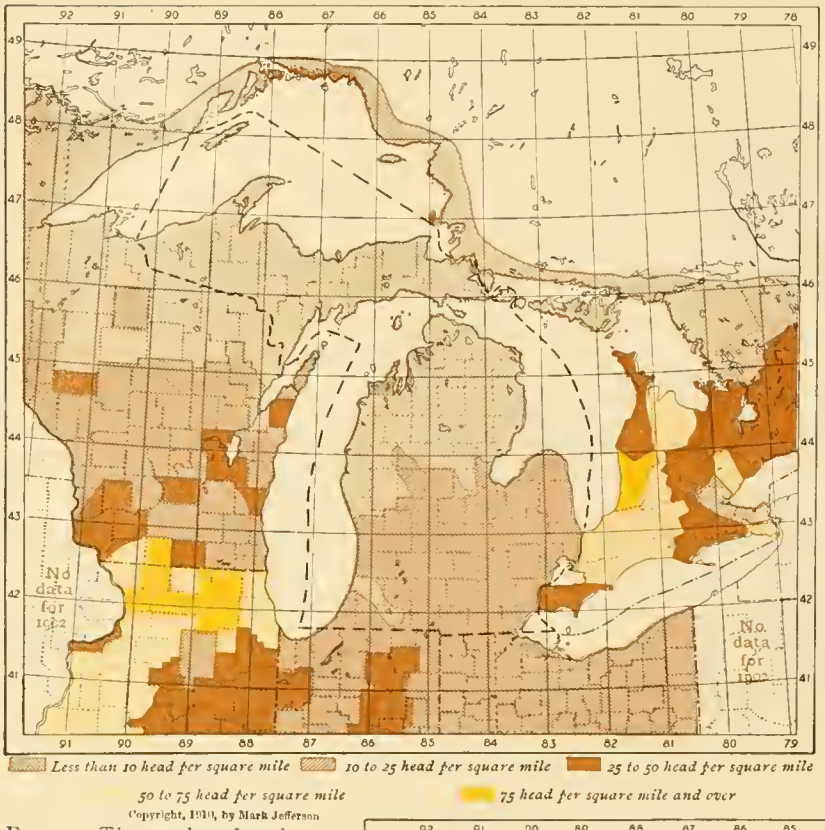


FIG. 31. *The number of cattle per square mile in 1902.*

coastwise trade of New York City, and three times as great as that which passes the Suez Canal. (Fig. 47.) The values are very much smaller, foreign trade handling many articles of very high cost. In 1904 there were carried eastward on these waters 130,000,000 bushels of grain, 21,000,000 tons of iron ore, 1,770,000,000 feet of lumber, and 1,000,000 tons of flour; and westward, 14,000,000 tons of coal. This is called 51,000,000 tons of freight, of which 31,500,000 passed through the Sault canals. In 1907 the amount of freight passing had fairly doubled. A great part of this amount moves between points beyond Michigan territory. The effect of the development of continuous water transportation on freight charges is indicated by the fact that in 1895 a ton of ore was carried from Duluth to Cleveland by water for 80 cents; by rail the cheapest price was $2.59. The ore was only worth $2.80 on the Cleveland dock. The commerce of the Great Lakes is the commerce of a great part of the United States.

Through navigation on the lakes is usually suspended in January, February, and March on account of ice in the connecting rivers. Probably none of the lakes ever freeze over solid,

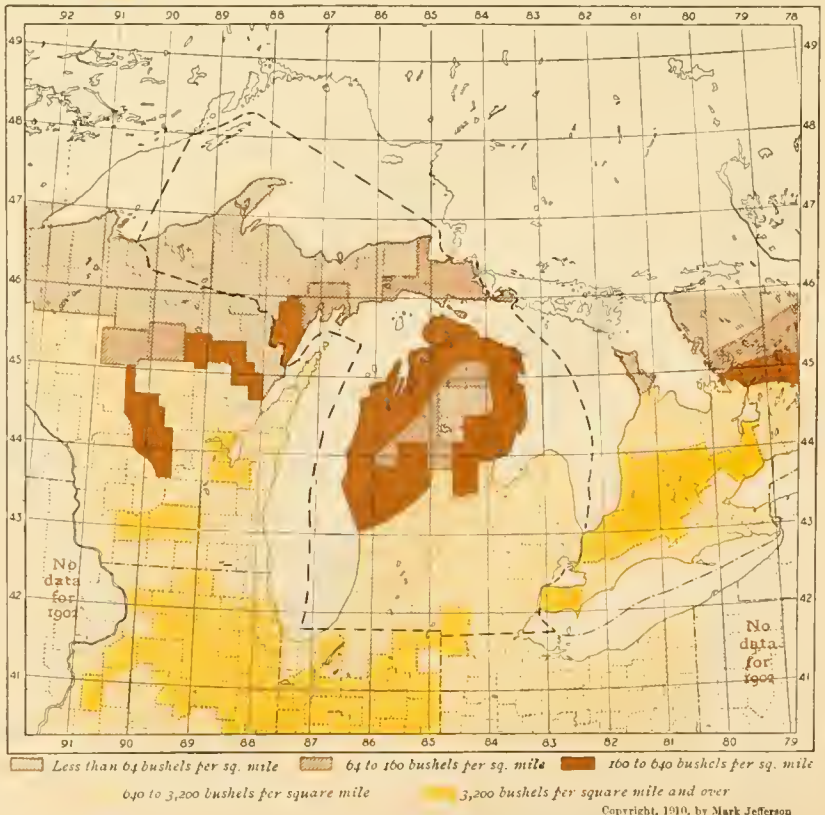


FIG. 32. *The yield of oats per square mile in 1902.*

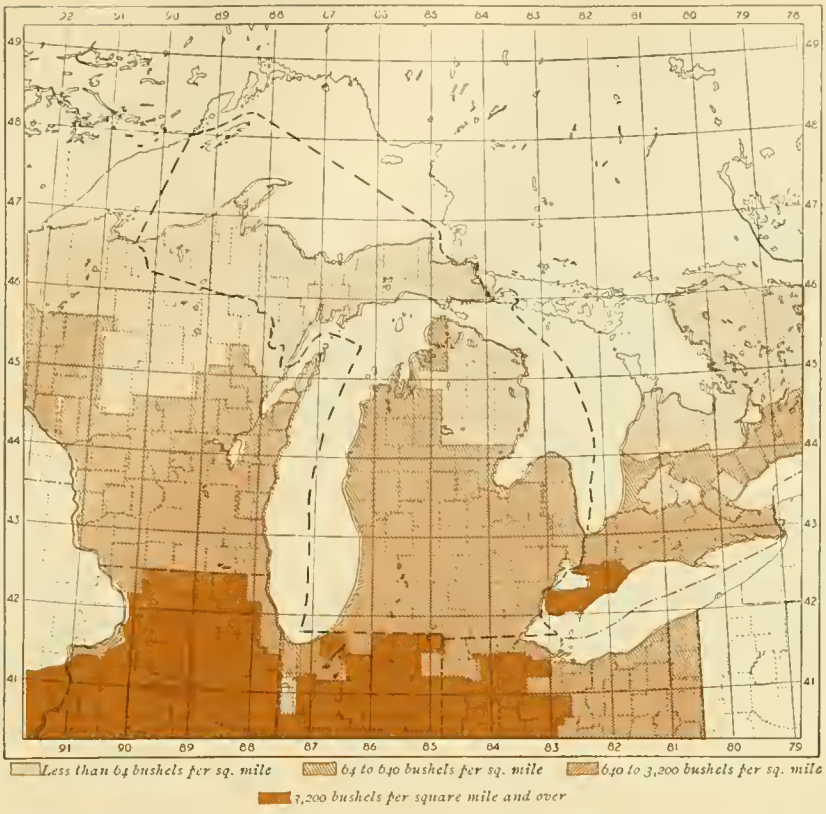
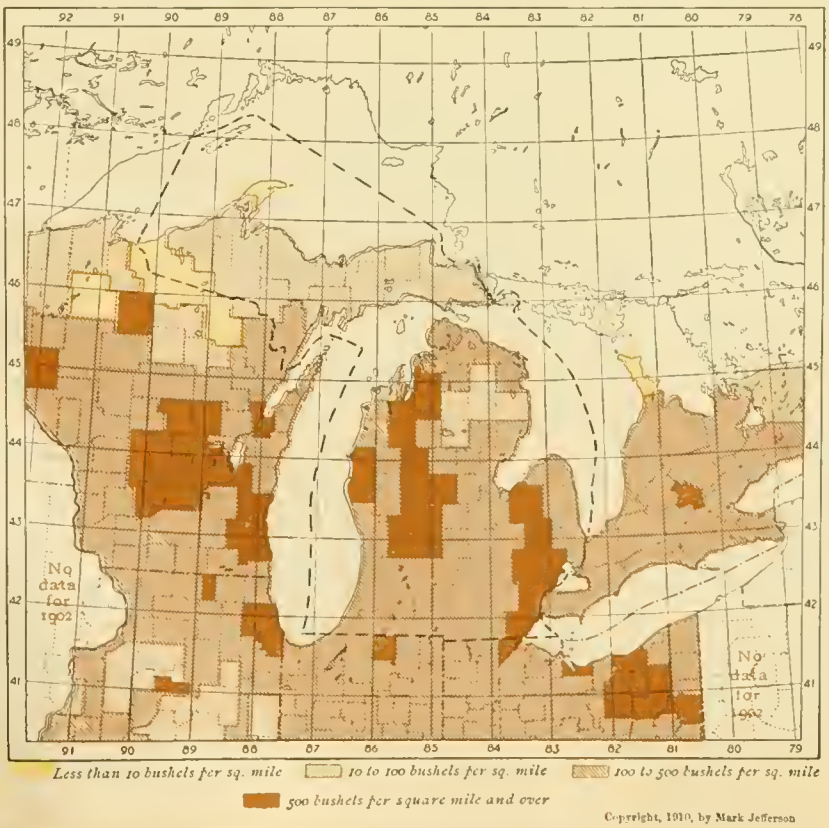


FIG. 33. *The yield of corn per square mile in 1902.*

but the bays do. St. Marys River at the Sault (Fig. 49) is generally crossed on foot in January and February. Put-in-Bay and Kelleys Island in Lake Erie usually have team connection with the Ohio shore for a longer or shorter time in February, and so does Mackinac Island with St. Ignace. (Fig. 49.) Detroit and Port Huron maintain a hardly interrupted service across the Detroit and St. Clair rivers by train and other ferries. Lake Michigan, too, is crossed by powerful train ferries through the winter between Ludington and Frankfort and Wisconsin ports, but drifting ice causes many interruptions. (Fig. 2.)

History. The territory northwest of the Ohio River was the earliest addition to the lands of the original colonies. (Fig. 36.) French trails crossed it along the lakes and rivers between the St. Lawrence and the Gulf of Mexico, and were protected from the Indian inhabitants by forts. In these were the Europeans and half-breeds, barely 4,000 in all, who represented the power of France. They were grouped in three settlements: at Detroit, at the Illinois towns near St. Louis, and at Vincennes on the Wabash. (Fig. 36.) The country was really in the



possession of the Indians, with whom a handful of the French traded for furs. At the close of the French and Indian War in 1763, the French claims passed to the English, who put an officer and a few troops in each of the forts. In the war of the Revolution, foraging parties were fitted out from these points against the settlements in Kentucky and Pennsylvania until George Rogers Clark invaded the territory in 1778–9, capturing the Illinois towns and Vincennes, Ind. These towns were never again given up, and at the close of the Revolution all of them passed to the United States by treaty. Congress planned to divide the whole region into three states, as shown by the black lines with dotted prolongations on the map. (Fig. 36.) Power, however, was reserved to make two more states out of that part of the territory which was north of an east and west line extending through the south end of Lake Michigan. This line has also been drawn on the map, though it was never adopted. (Fig. 36.) Had it actually been held to, both Illinois and Indiana must have been left without any frontage on Lake Michigan, and Toledo would have been excluded from Ohio. It is not strange that when there were enough inhabitants in the three southern portions to entitle them to statehood, they should have sought to change these northern boundaries. Ohio added enough to include Toledo, although Michigan was already governing it under the Congressional division. This was in 1802. Indiana added rather more territory in 1816 when she was admitted, and Illinois in 1818 added still more. Ohio stated her claim distinctly in the constitution that she submitted to Congress, but Congress took no specific action on the boundary, so a dispute arose between Michigan and Ohio for possession of Toledo. It was settled in 1837, when Michigan became a state, by ceding Toledo to Ohio and by giving to Michigan the upper peninsula,

FIG. 35. *A threshing scene in a farming district in Michigan.*

FIG. 36. *The Northwest Territory of 1787.*

not assigned her in the original division, although allowed her in territorial apportionments. (Fig. 36.)

The way people spread over the state is shown on the map (Fig. 52), where the darker colored counties had the earlier organization of government. The effect of admission to statehood is seen in the spread between 1830 and 1850, as also of the beginnings of copper extraction in the upper peninsula.

The time when lumber and iron began to be sought actively in upper Michigan may also be made out. Iron was the last county to be organized. (Figs. 2 and 52.) The Canadian country north of Lake Superior is still in territorial form, though most of Ontario was earlier settled than Michigan. (Adv. Geog., Fig. 312.) Nearly a quarter of the people of Michigan were born in foreign countries, half of these from some British territory, and a quarter from Germany. Six per cent of our people came from the state of New York, and two per cent each from Pennsylvania and Indiana. (Part III, Table, p. 46.)

FIG. 37. *Among the pines on the DeWard estate.*

Education. Michigan has a slightly denser population than the average state, yet the fact that the rural population is greater than in most states, and that she has more than the average number of foreigners, makes the development of general education difficult here. The wealth of the state, too, as measured by real and personal property per capita, is slightly less than that of the average state. Nevertheless, Michigan excels the average state in that she gives longer schooling to a greater part of her population, pays her teachers more per year, at a less cost per taxpayer and per capita, and has a much larger amount of school property, in which only six states surpass her. The University of Michigan (Fig. 54) had its origin in 1817 with control of all public education in the territory, of whatever grade. The

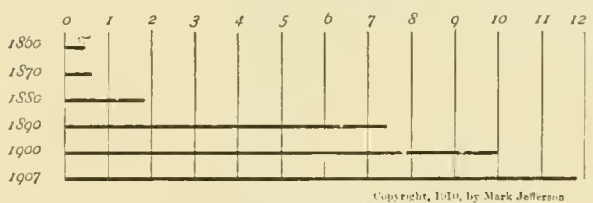


FIG. 38. *The iron ore mined in Michigan for each ten years from 1860 to 1900, and from 1900 to 1907, in millions of tons.*

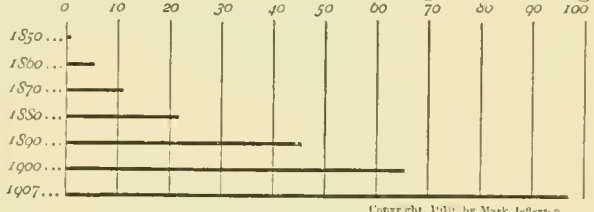


FIG. 40. *The amount of copper ore mined in Michigan in each ten years from 1850 to 1900, and from 1900 to 1907, in thousands of long tons.*

FIG. 39. *A modern freight boat of the Great Lakes.*

university has always recognized its obligations as head of the educational system of the state. Through its visiting committees, and the admission of graduates of the leading high schools without examination, it has exercised a potent influence in shaping the courses of study in high schools, and in improving the quality of the work done in all grades of public schools. At the present time (1905) the university has a large number of students from other states, and some even from foreign countries, the total attendance being 4,600 students. It thus easily ranks as the greatest state university in America.

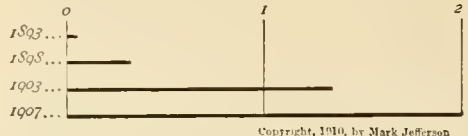


FIG. 41. *Coal mined in Michigan for each five years from 1893 to 1903, and in 1907, in millions of tons.*

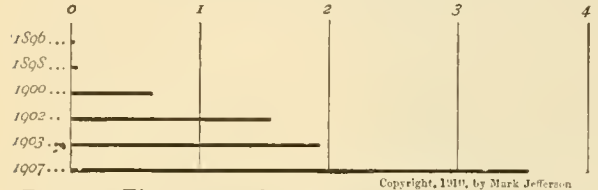


FIG. 42. *The amount of cement manufactured in Michigan for each two years from 1896 to 1902, and in 1903 and 1907, in millions of barrels.*

A powerful influence for education has been exerted also by the State Normal College at Ypsilanti, the oldest institution of its kind west of the Alleghenies, whose students have gone out to teach not only in this state but throughout the country. The preparation of teachers is also the business of three other state normal schools, the Northern at Marquette, the Central at Mount Pleasant, and the Western at Kalamazoo. A finely equipped and efficient mining school at Houghton, in the heart of the copper country, sends its graduates out over the whole country.

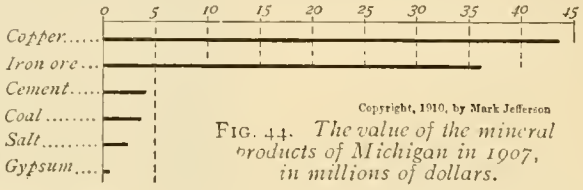


FIG. 44. *The value of the mineral products of Michigan in 1907, in millions of dollars.*

The Michigan State Agricultural College is situated near Lansing. (Fig. 60.) Denominational colleges of excellent standing are Adrian, Hope at Holland, Albion, Hillsdale, Olivet and Kalamazoo. Properly educational, as well, are the state commissions: the geological survey, which under that great man, Douglas Houghton, taught the people of the state where to find their

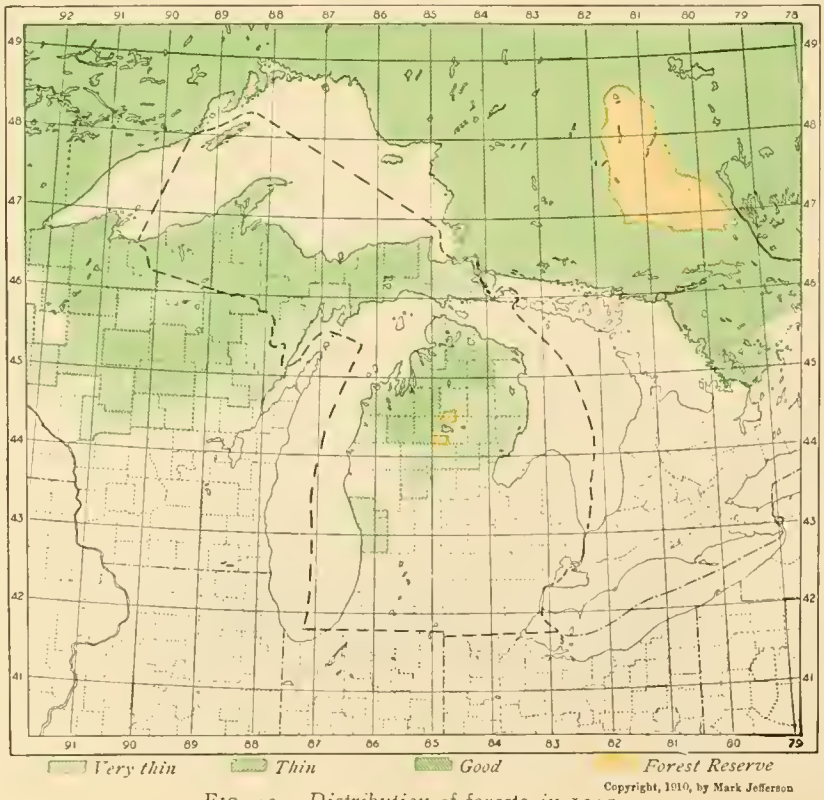


FIG. 43. *Distribution of forests in 1905.*

mineral wealth; the forestry commission, which, too late to save the great forests which once covered the state, is showing how to replace them for the future; the fish commission, which is continually putting whitefish fry into the lakes in order to replace the fish taken out, and which has also long been teaching the fisherman that to catch small fish, that are not yet grown to full size or best quality, is really to defraud himself. Fish were not merely disappearing, but the quality was also deteriorating under an energetic pursuit that allowed none to attain maturity. By replacing in the lakes fry hatched by the state, and protecting them from capture until they were of size, the catch has fairly doubled in its value during the last seven years, after dwindling until it seemed as if it were about to vanish.

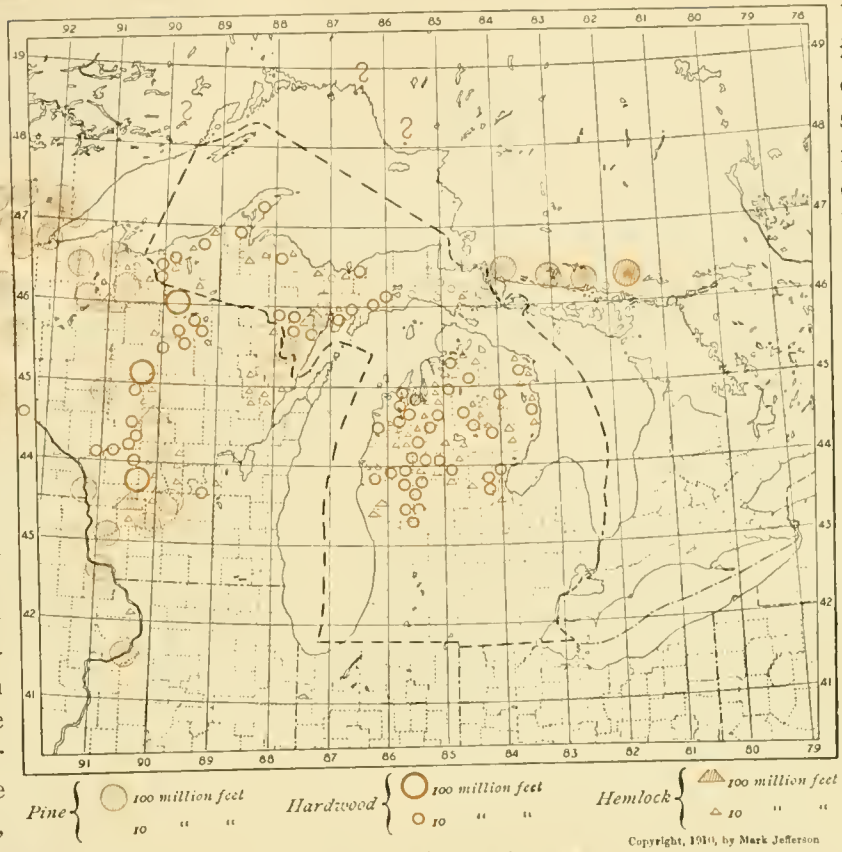


FIG. 45. *Lumber cut in 1904.*

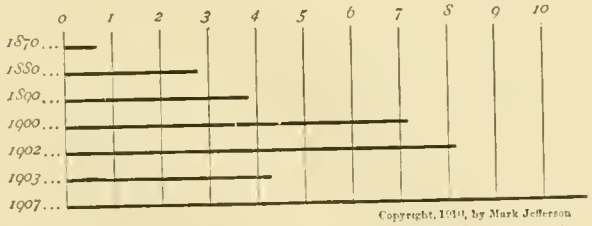


FIG. 46. *The amount of salt produced in Michigan for each ten years from 1870 to 1900, and for the years 1902, 1903, and 1907, in millions of barrels.*

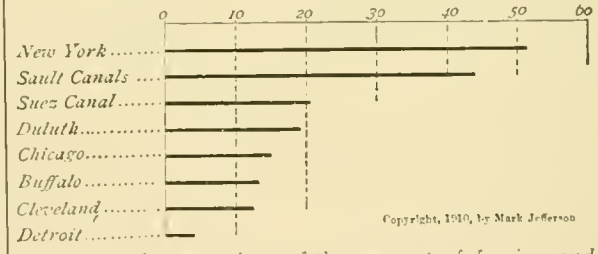


FIG. 47. *A comparison of the amount of foreign and domestic freight passing in 1907, in millions of tons.*

II THE GROWTH AND DEVELOPMENT OF CITIES AND TOWNS

Development of the City or Town. Though Michigan is mainly a farming state, its people need cities and towns as well as farms. In Washtenaw County the farm is oftenest of eighty acres, with four or five people living in the farmhouse. Such houses are strung irregularly along the highways. But at road corners every few miles we find them nearer together. Here stand also perhaps a church, a schoolhouse, and almost certainly a store. It is a beginning of village or urban life. Here is the post office. The little gathering of houses responds to needs that all people feel: need of society, need of religion, of education, and the very urgent needs met by the store. From it the neighbors obtain their daily supplies of kerosene, lamps, flour, sugar, tea and coffee, nails, common plates, rough clothes, shoes, and calico. Here their butter and eggs are gathered for larger markets. One rarely goes five miles in southern Michigan without coming on such a corner store. In the thinner settled north they are farther apart, not merely because of larger farms but also because of the great stretches of woodland or lands unsuited to agriculture. But the prosperous farmer has many needs that the corner store cannot supply—his furniture that he uses daily, but replaces only at long intervals, his wife's better clothes and his own. For these he seeks the neighboring village and its larger store. There too he finds the bank where he deposits his money, there he may send the older children to school, there he attends the larger meetings of men than are afforded by the crossroads corner. So when farm lands are well taken up, a village is sure to grow up within a day's drive of any farmer, and the prosperity of the farmers is at once reflected in activity of business at the village. Each is dependent on the other. Naturally, villages are more numerous in the closer settled south than farther north. (Figs. 49 and 50.)

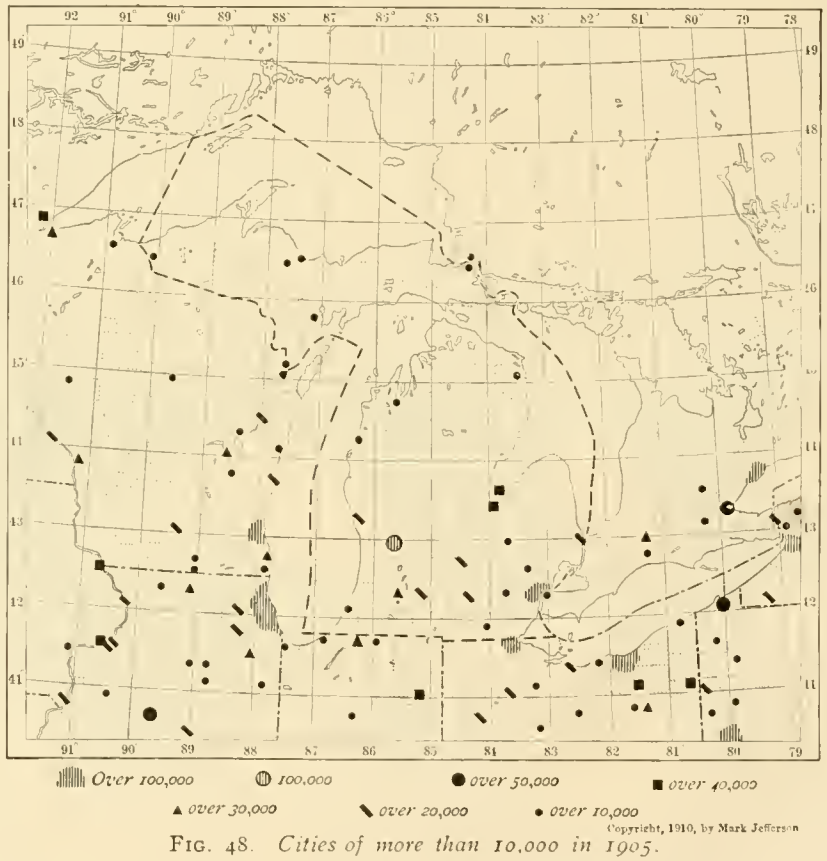


FIG. 48. *Cities of more than 10,000 in 1905.*

Articles of real luxury that only the more prosperous can afford, and even they need at infrequent intervals, can only be kept at the cities that occur at wider distances than the villages, since they need the patronage of the people of a larger area. The city stands on the line of the railway or by the lake, so that it has rapid communication with the factories and seaports whence it obtains supplies and to which it sends the product of the countryside. Here appears a whole series of new conveniences demanded by the new conditions. The crowding of many men together here pollutes the ground with the wastes of many houses. The diseases that result have

FIG 49. *A map of the Northern Peninsula of Michigan.*


MICHIGAN
SOUTHERN PENINSULA
SCALE
32 Statute Miles to one inch
Capital ✪ County Seats ⊙ Other Cities •
Cities with 300,000 and over .....Detroit
Cities from 20,000 to 300,000.. Kalamazoo
Cities from 5,000 to 20,000 .... Flint
Cities from 1,000 to 5,000 .... Albion
Railroads Navigable Rivers
LAKE MICHIGAN
LAKE HURON
SAGINAW BAY
CHEBOYGAN
EMMET
PRESQUE ISLE
CHARLEVOIX
MONTMORENCY
ALPENA
ANTRIM
OTSEGO
KALKASKA
CRAWFORD
OSCODA
ALCONA
LEELANAU
GRAND TRAVERSE
BENZIE
MANISTEE
WEXFORD
MISSAUKEE
ROSCOMMON
OGEMAW
IOSCO
MASON
LAKE
OSCEOLA
CLARE
GLADWIN
ARENAC
OCEANA
NEWAYGO
MECOSTA
ISABELLA
MIDLAND
BAY
HURON
TUSCOLA
SANILAC
MONTCALM
SAGINAW
SCHOOLCRAFT
MACKINAC
CHIPPEWA
DELTA

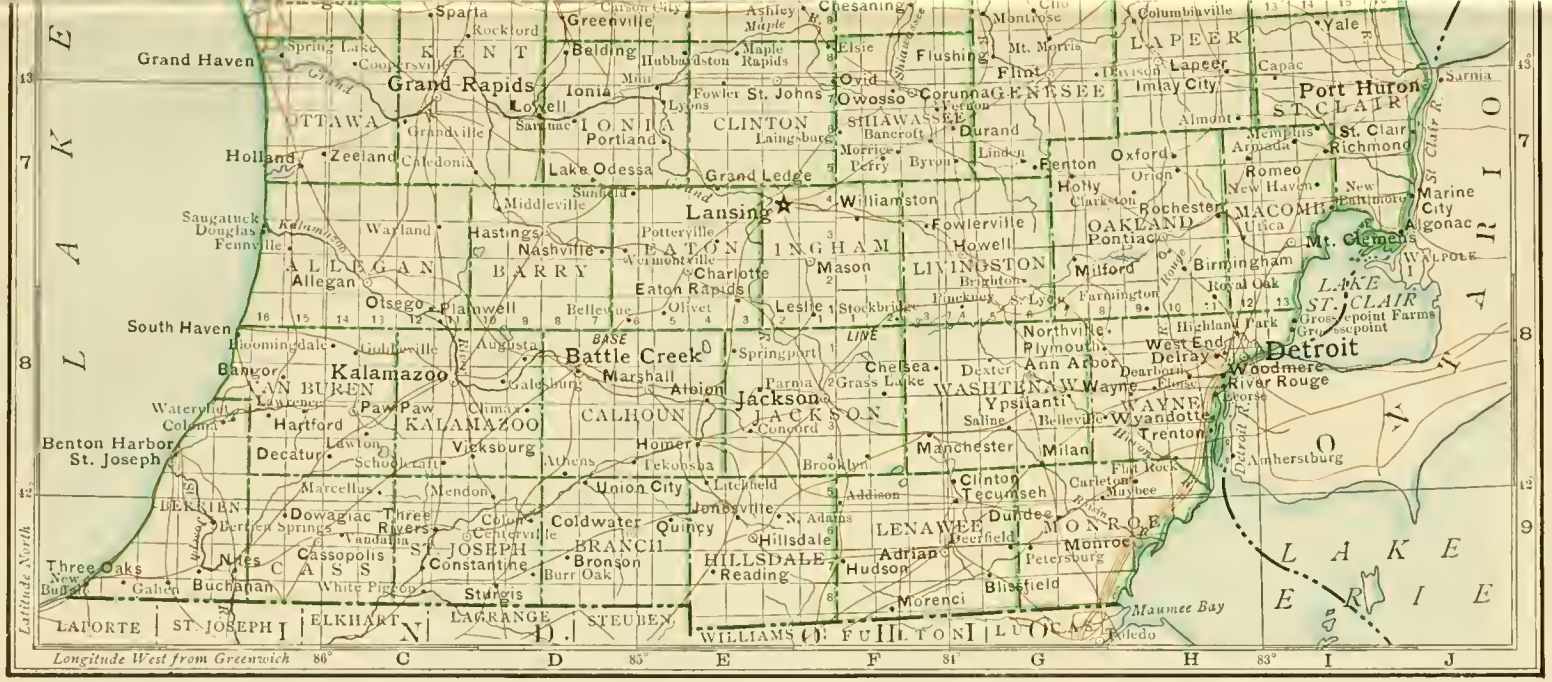


FIG. 50. *A map of the Southern Peninsula of Michigan.*

taught men to provide sewers and pure water from a distance from sources of contamination. Much teaming over the roads makes them so bad that in rainy weather they become fairly impassable. They must be paved. Lighting, cleaning, and policing follow. Though these things make city life very different from the life of the farm, we must not forget that they exist for each other. The farmers indeed could get along without the city, as they had to do in the old pioneer days, but they would find it very inconvenient. If there were no farms with men to till them, the cities simply could not exist. In these cities, of course, the products of the farms will be sorted in preparation for other markets or perhaps undergo some process of manufacturing. All these tasks of the city call for workers, and if the countryside from which products are drawn is large, a great population is gathered together. Some among these cities grow faster than their neighbors, sometimes because they have rail or water transportation available in more directions, sometimes because they are fortunate enough to possess a group of energetic men whose character imposes confidence. Each city, however, has its growth limited by the size of its agricultural province. Large cities cannot rise very near each other. In the region of the Great Lakes there is one city, Chicago, that is so large as to be quite out of the class with any others, with more than two million people. There are six others that pass a hundred thousand: Milwaukee, Detroit, Toledo, Cleveland, Buffalo, and Toronto. All of these, like Chicago, lie at the border of the lakes. (Fig. 48.) We may be sure that cheap water carriage has influenced their growth. And all of them lie on the belt of denser southern population, as we may see on comparing the population map (Fig. 51) with the map of the cities (Fig. 48). The only cities with over twenty thousand in

the north are Duluth and West Superior, in connection by the lakes with the large cities of Lake Erie. To Chicago the whole lake country is tributary. If a train stops among the jack pines of the Northern Peninsula to load on crates of huckleberries by the trackside, they are for Chicago. If salt produced in Michigan wells is to be sorted out into grades, it is to suit buyers in Chicago. Good train connection for Chicago may be had in any of the small cities of the map. There are few merchants in the whole region who have not visited Chicago at some time. They can buy anything in Chicago. If it is not made there it is kept in stock there. And since everybody goes there to buy, what place could be better to take anything you have to sell? When a city gets as big as that, its influence extends over a great stretch of country. There is no other big city here because at present there is no room for any. A little thing decided where Chicago should be. It is the nearest point on the Great Lakes to the Mississippi Basin. In wet weather a century ago a loaded canoe could float from the Illinois River to Lake Michigan. The days of the canoe have long gone by on those waters, but at Chicago the products of the plains of the West still meet water carriage by the lakes. If they pass eastward mostly by rail now, the rates are lower than they would be without the chance of competition by boat, which no railroad could monopolize on the Great Lakes. Railway lines eastward from the Dakotas, Minnesota, and Wisconsin are crowded together at Chicago by the north and south obstruction of Lake Michigan. Similarly, Milwaukee gathers up, for lake shipment eastward, produce from Wisconsin; a smaller business, since it is drawn from a smaller area. Points equally near Chicago and Milwaukee find it more profitable to ship to the larger center, since freight rates are cheaper to points from which there is more return business. Detroit and Toledo stand in much the same way between southern Michigan and the country close to the south of it, and eastern points via the lakes. Business is to the eastward. The eastward-facing shores show a line of cities great and small, those facing westward, few or none. On the west side of Lake Michigan are eleven with more than ten thousand people; on the east side but four, all small. So also on Lake Huron. At the cities of Lake Erie are gathered up again the shipments of the West, the grain to go on east by rail, the ores to meet the coal of Pittsburg for their smelting.

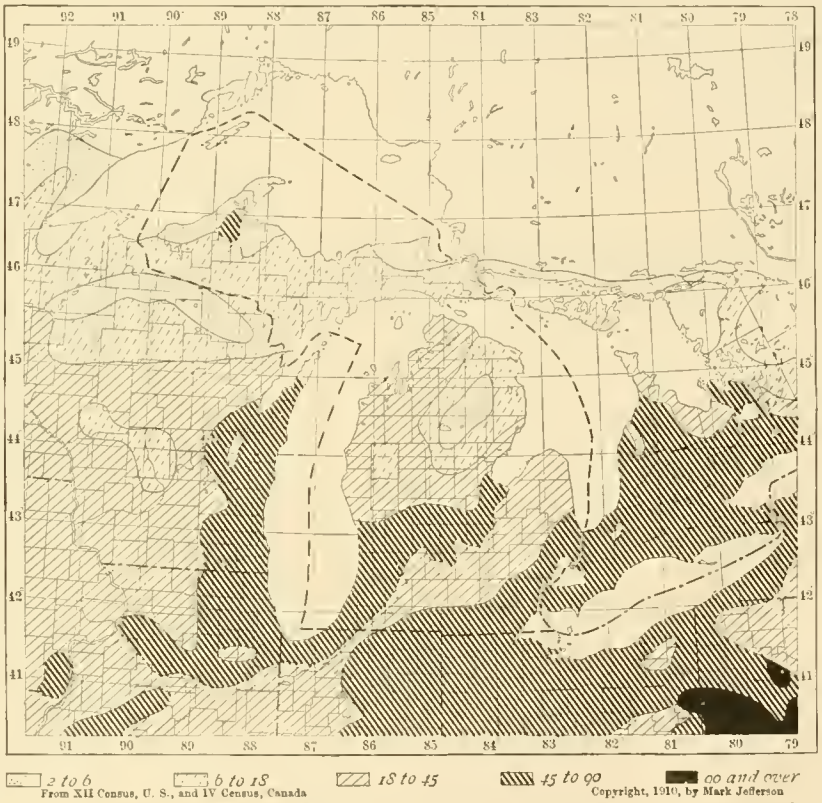


FIG. 51. *Map showing distribution of population and density per square mile.*

Within Michigan's boundaries, Detroit is the only large city. Smaller, but still of important size, are Grand Rapids, Saginaw, Bay City, Kalamazoo, Jackson, and Battle Creek.

In all the state has twenty-five places of more than ten thousand people; if everything down to a thousand be counted, more than two hundred, and if the huge community of Chicago be excepted, Michigan contains examples of all sorts of towns and cities that the region affords. They are young. They have grown tremendously. Even Detroit so lately as 1830 had but six thousand people. When some of us visit Europe we are discouraged by the beauty of the cities over there, discouraged with the home town. But the charms of European towns are the result of the labors and care of generations and generations of men through a thousand years or more. Most of ours have existed less than fifty years, but those fifty years have been years of such accomplishment as Europe could well be proud of. The fairest city in Europe, at the end of its first fifty years, was hardly more than a collection of mud hovels. The beautiful city of Bergen in Norway has a thousand years of history, but it has no sanitary sewer. None of our cities is without the beginnings of adornment. Many have streets and districts of real beauty already. None has failed to pay more and more attention to it as it has grown in age and wealth. All give attention to the public health, by supplying wholesome water in place of the dangerous shallow well, sewer connection in place of the dangerous private cesspool, and seek to educate their citizens to accept the protection thus offered; while active citizens unweariedly campaign to make known defects in these services and secure their remedy. Detroit has a splendid water service with a tap in use for every five people in the district, at a high cost, though she has the good fortune to have a great river of water of unsurpassed clearness flowing past her streets. Saginaw, under the disadvantage of a sluggish stream of turbid water, provides a tap for every twelve of her inhabitants, besides a hundred deep wells on her streets, and she is now busy preparing to improve the supply by filtration. The other cities of the state have water supplies between these extremes. The amount of water delivered to each tap varies from three hundred and sixty-one gallons a day at Kalamazoo, where they have meters in every house and pay for all they use, to twelve hundred at Bay City, where forty-four per cent of their services are metered and the people furthermore are buying bottled waters for drinking. Where table water is bought in the street, it costs from eight to ten cents a gallon; city supplies, including interest charges, cost from two to nine cents a thousand gallons. A third of the people of Saginaw have their homes connected with the sewers, half the people of Kalamazoo and Battle Creek, sixty per cent of those of Jackson

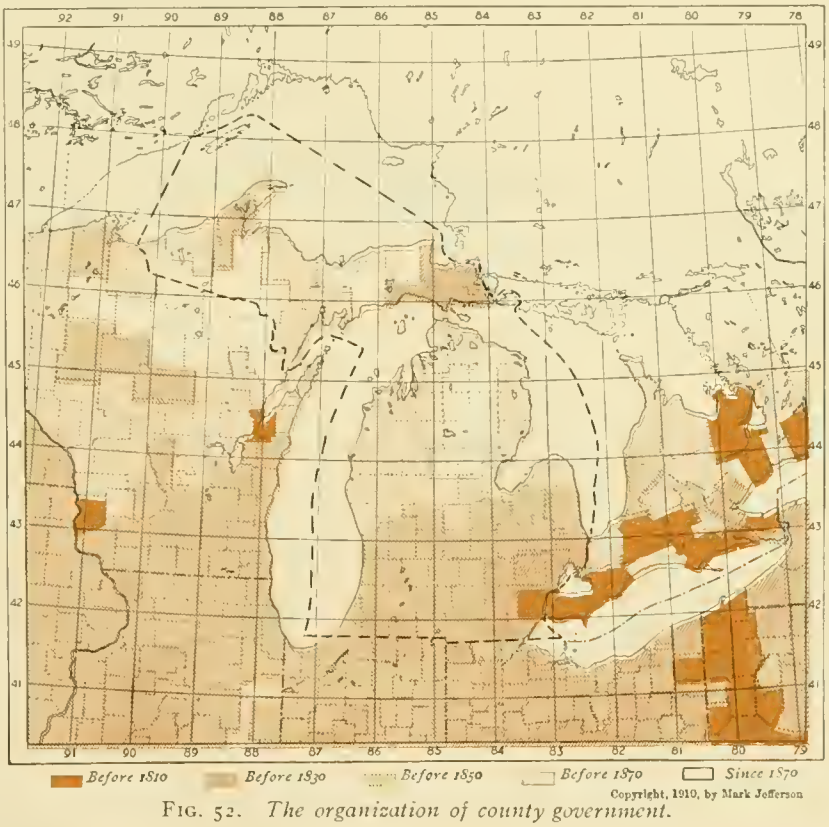


FIG. 52. *The organization of county government.*

and Bay City, and three quarters of those of Grand Rapids. These improvements have made Michigan cities safe places to live in. Their annual deaths for a thousand inhabitants rarely exceed fifteen, which is somewhat less than the average for all parts of the United States where these statistics are kept, including the healthful country with the less wholesome cities.

It is a great credit to the larger Michigan cities that they have done so much for these public services, that they have given publicity to dangers that threatened the citizens in order to secure a remedy. It is a great credit to a city like Marquette, whose water supply is occasionally threatened by a wind that sweeps traces of sewage into the part of the lake where she takes her water, that she publishes daily analyses of the water, that all may know whether danger threatens and how often danger occurs. There are always those in any community who oppose such publicity on the plea that it is not good "business" to admit that the home city has any defect.

FIG. 53. *A map of the Detroit River, and vicinity.*

Detroit and Near-by Cities. *Detroit*, the chief city of the state, stands on the first high ground on the west bank of the Detroit River as one ascends from Lake Erie. Rather a strait (détroit) than a river it seemed to the Frenchmen who named it. (Fig. 53.) At the gateway to one of the richest provinces of Canada, with all the long-distance commerce of the lakes passing its wharves, with all Michigan behind it, it is destined to be a great trade center and an important customs port. Railroads radiate from it in every direction, and many of the great shipping interests that handle the grain, ore, and coal traffic of the Great Lakes make it their headquarters, while smaller steamer lines start from here. Here, for a long time, railway ferries have transported loaded trains into Canada on the great continental lines, which now pass through a great tunnel of twin tubes beneath the river, uninterrupted by the ice of future winters. From this point the United States government exercises supervision over the vessels and waterways of the lakes. Here are extensive shipyards for the construction and repair of vessels employed in the lake trade. Grain, lumber, wool, and meats are trans-shipped here in large quantities. The city contains the chief offices of several of the large lumber corporations which operate in the forests of northern Michigan and Canada. The unrivaled shipping facilities and easily obtained fuel and raw materials have made Detroit a manufacturing city of high rank. The chemicals, tobacco, and garden seeds put up here are widely known. Among other important manufactures are stoves, locomotives, railway cars, and leather goods.

Detroit is an attractive city, with well-kept streets and a park system that is almost without rival in the country; of this Belle Isle is the finest feature. As Michigan grows in population Detroit is sure of growing importance among American cities.

About thirty-five miles west of Detroit, on the Huron River, is *Ann Arbor*, the seat of the State University. (Fig. 54.) It is also the trade center of a prosperous agricultural region and has flouring mills and a number of manufactories.

Southwest of Ann Arbor, in Lenawee County, stands *Adrian*, a trade center of southeastern Michigan, with flourishing manufactures. It has two of the largest wire fence factories in the world. Adrian College and the State Industrial School for Girls are located here.

Twenty-six miles northwest of Detroit, on the Clinton River, is *Pontiac*, within a lake district which forms an attractive and popular

FIG. 54. *The Law Building of the State University at Ann Arbor.*

summer resort region. The near-by territory produces wheat, rye, apples, and peaches, much of which is shipped by Pontiac to Detroit. Carriages and automobiles are manufactured. Pontiac is the site of an asylum for the insane.

Northeast of Detroit, on the St. Clair River near the southernmost point of Lake Huron, is *Port Huron*, a commercial town with natural advantages similar to those of Detroit. It is the headquarters for boating and fishing interests, and has some trade in lumber and a shipyard. At Port Huron the railroad connection between the United States and Canada is made by means of the noted St. Clair tunnel, which passes beneath the river bed. Salt deposits and oil wells are found in the vicinity.

Saginaw Valley and Lake Huron Towns. In the early days of lumbering the great pine woods of the Saginaw, there was no railroad to export the lumber. The necessary line of movement was by Saginaw River and Bay, and thus were fostered the two cities, *Bay City*, at the mouth of the river, and *Saginaw*, where the first ridges of higher ground come to the river right and left. It is the same ridge that guides the Tittabawassee and Cass rivers to join the Saginaw backhandedly. For many years these places had no rivals as lumber towns. With the coming of the railroads and the exhaustion of the pine from the valley, the influence that gave them their first impetus to growth was lost. Both were slightly larger in 1890 than in 1900. The great year of the lumbering was 1888. Now both cities have resumed their growth in healthy dependence on the varied resources of the surrounding country, among which is foremost the agriculture for which the lumbering cleared the ground. It is a resource that will do more for Saginaw every year, as population increases in the district and methods of cultivation improve. Bay City still handles many logs from the north, and coal mining has been developed in the vicinity of both places.

Saginaw. Four wards of Saginaw are shown on the map (Fig. 55) to have a greater density of population than 10,000 to the square mile, yet it is a city of suburban type, with much light and air. Many residence districts, like Michigan Avenue, Jefferson, and much of Genesee, are well kept and have beautiful homes. Trees are everywhere and beautiful, and on the east side parks have already taken the place of much low bayou ground, more of which will be redeemed when the Rust Lake improvement is finished.

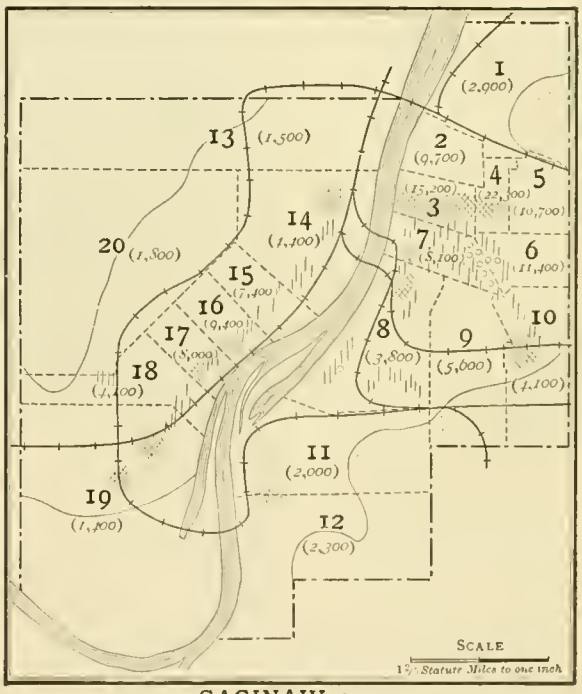


FIG. 55. *The dotted portions of the city near the boundaries are thinly built up. The business districts are shown by the crossline shading, the residential region by the parallel ruling. Small circles show where the finest places are. The wards are numbered, the small numbers in parentheses being the number of inhabitants to a square mile.*

The post-office lawn, the bit of grass to the northeast, and the Hoyt Memorial Library and its grounds are hard to match in a city of the size. The reference library itself is a monument to the devotion of one of the city's builders and to the culture of the people.

The health of the city is good, but its situation has made its sanitary problems difficult. The river is sluggish to remove sewage rapidly. The service water taken from the river needs a filtration plant that the city is planning to erect to make it satisfactory to the people. At present it is little used for drinking. If you stand at one of the street corners in Saginaw some morning, you will see some one come to a pump like the one shown in Fig. 56, work it heavily, drink from the cup attached, and pass on. Presently another comes from a store with a pail, fills it, and goes back. If you have the curiosity to try the pump you find it goes hard. The rod is long and heavy and lifts the water from a depth of more than one hundred feet. Saginaw has not one town pump, but one hundred and fifteen of them—the Deep Wells. Also, there are some fifty private ones. The Deep Waters satisfy the eye by their brightness, and are safe though often rather salt. When the neighbors get together fifty dollars they take it to the city clerk, and if there is money enough in the well fund, one hundred is put with it and a deep well driven. This and bottled waters sold from carts have been the main dependence for drinking water.

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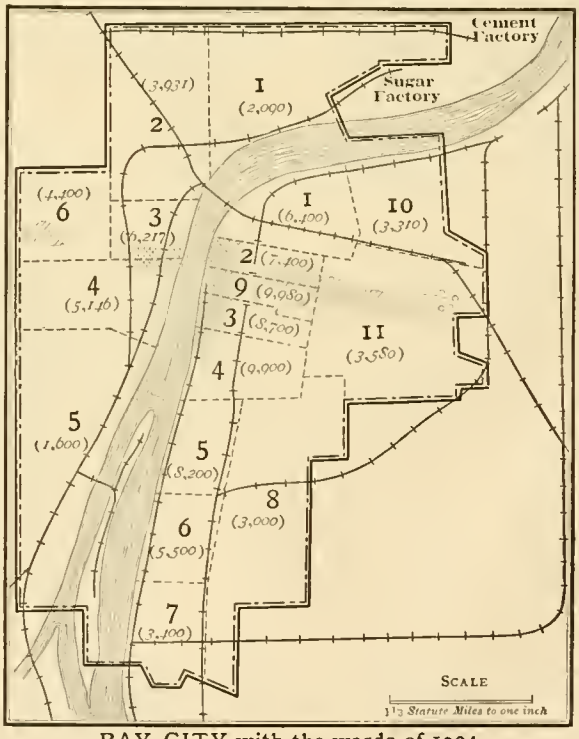
FIG. 56. *One of the Deep Wells at Saginaw.*

As said before, Saginaw is now a growing city. Lumber is still important and leads to other manufactures,—of furniture, woodenware, flooring, doors, sashes, boxes, barrels, and chemicals obtained from wood. Salt is obtained from the rocks beneath the city and also coal, as is evidenced by great black heaps in the southern part of the city. In the city's near farm lands, beets are cultivated for an active share in Michigan's output of sugar. (Fig. 21.)

Bay City. Bay City (Fig. 57) has grown up from a number of villages at the last bend of the Saginaw River before it joined the bay. Low beaches of the ancient lakes here lift the ground a little above the marshes and the bay. In 1837 lower Saginaw was platted about where the business center now is on the east side; the whole left bank was at that time reserved to the Indians. Twenty-two years later this was incorporated as the village of Bay City, with extension to the river on the north, and including Portsmouth village on the south as far as the present Twenty-fourth Street. By 1862 there was enough demand for wharf privileges to send business over to the left bank, where the village of Salzburg was platted. In 1865 Bay City received a city charter and was fairly doubled in size by the addition of a residential strip on the east. The next year another settlement on the west bank had become large enough to incorporate as the village of Wenona, and



BAY CITY with the wards of 1904

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FIG. 57. *The business district is crosslined. The fine residence region is shaded with parallel lines, the most luxurious with little circles. The ward numbers are in two series, as at the time of the last state census in 1904 there were two cities, Bay City and West Bay City, united in 1905. The numbers in parentheses are the number of people to the square mile.*

still another at Banks in 1871. All of this growth shows how lumbering was thriving and booming through those years. Two years more passed, and Bay City annexed another fragment of Portsmouth on the south. In 1877 West Bay City was incorporated with all the territory on the left bank as now. Finally in 1905 West Bay City (13,000) and Bay City (27,000) were united under the latter name.

The lumber boom reached its highest point about 1888. In 1882 there were eighty mills on the eighteen miles of river between Saginaw and Bay City. Here the logs were rough-sawed and exported in that form; over a billion feet in that year, and all of it went out by water. Now there are but eight mills, seven of them at Bay City. In 1908 Bay City made but a third of a billion feet of lumber, not rough-sawed now, but finished mill products. Of the rough logs used a quarter were imported from Canada. Of this 300,000,000 board feet of product only 125,000 were taken away by boat, so little does the river figure in the city's life to-day. The cement factory, it is true, shipped its output of 1908 by water. The banks of the Saginaw River here are lined with wharves and basins, admirably connected with the railway. A branch of the Detroit & Cleveland line of steamers comes here and to Saginaw, but almost all of the business that sustains both cities moves now by rail.

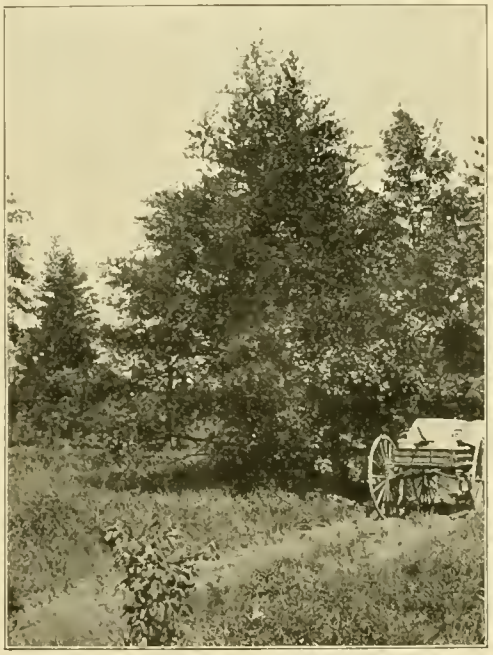


FIG. 58. *Among the jack pines of Roscommon County.*

The lumber mills are bound to run as long as logs can be obtained. Other manufacturing industries in iron and wood have been fostered by the presence of skilled labor, such as the making of railroad wrecking cranes, wooden and steel boats, and bicycles. There are also iron plate mills and a large cement factory. The coal mines sell their product locally at $3 50 per ton. Three sugar factories put the city in the best of relations with its farm neighborhood. The alcohol distilled from their refuse is said to have paid a Federal tax of more than two million dollars. Turpentine is being profitably distilled from old Norway pine stumps that have long disfigured the landscape of the northern counties and embarrassed agriculture there. Bay City's interests are henceforward closely bound up with the development of the surrounding country. The farmer is to be more to her than the lumberman or the sailor.

Water for the city use is here drawn from the entrance to Saginaw Bay and is unsightly but not unsafe, except when the engineer opens the valve into the river because the west wind makes water low in the bay. The sewage goes to the river and moves off sluggishly. Much bottled water sold on the streets indicates that the well-to-do are willing to pay a high price for drinking water that is white and clear.

A grateful spot for the people in summer is the electric railway company's park at Wenona Beach, on a grassy shore under the willows. Shade trees are abundant throughout the city. Some of the streets are fairly parklike, and sumptuous residences suggest prosperity.

Flint, on the Flint River, thirty-four miles southeast of Saginaw, bases its prosperity on the handling of farm produce, on flour and woolen mills, and on its woodworking industries. Flint leads the world in the manufacture of medium-grade carriages. One large factory turns out 400 sets of carriage wheels as well as 100 sets of automobile wheels a day. The making of automobiles has become an important industry in Flint with the result that the growth of the city, following the great increase in motor plants, was beyond its housing capacity. On the Shiawassee River, twenty-five miles to

the west of Flint, and well within the central coal fields of the state, lies the flourishing town of *Owosso*. It has an extensive country trade, manufactures wooden house fittings of various kinds, and is the seat of railway shops.

On Thunder Bay, an inlet of Lake Huron, lies *Alpena*, a lumbering town with a trade in finished lumber and manufactures of laths and shingles. Here are large cement works and a United States fish hatchery.

Grand River Valley Towns. *Grand Rapids* is a beautiful city of 100,000 inhabitants, open built and country-like in the size of its house lots. Only ward seven on the west side attains a density of population of 10,000 to the square mile, though three and ten come very near it. (Fig. 59.) The high terrace bluffs that here inclose the valley stand some distance back from the Grand River on the west side, with the result that in high waters a considerable strip on that side is liable to flood. Against this danger the city has reared the protection of a massive flood wall. On the east the bluffs rise closer to the river's edge, and the slopes are parklike, with beautiful homes a very short distance from the business district. Some of these places have grounds so well cared for and so ample that they are truly palatial, but open to public view and enjoyment of all who pass. Most of the homes of the laboring men, too, are neat and attractive. Individual neglected ones occur in any quarter, but homes that are entirely attractive and charming are to be found in every part of the city. Usually in our zone of the west winds, the western districts come to be sought after sooner or later for residential districts, since there one has the cleaner, purer air from the country. This is true, for instance, notably in the west end of London and of Boston. Probably our cities are too open yet to feel the difference. In Grand Rapids the western slopes have only the rather ornate John Ball Park; for the rest they are little used. Luxury distinctly lives to the eastward. Perhaps the height of the eastern slopes above the river gives them a cleaner sweep of air from the country off to the westward; perhaps the valley depth swings the west winds locally into a southern direction. The city owes its start to the Grand River and the rapids. Down the river came the splendid logs of the central valley as at Saginaw, with the especial advantage here of water power to saw them by. The prevalence of suitable hard woods early led to furniture making, which became so well established at last that now the city maintains a well-deserved reputation for its product, long after the neighboring forests are gone and the lumber must be imported from a distance. A considerable population means a steady demand for produce supplies, and a wide tributary region has become the agricultural province of the city. Thus Grand Rapids ships very large quantities of fruit. This province is large enough and rich enough to assure a steady future growth. Grand

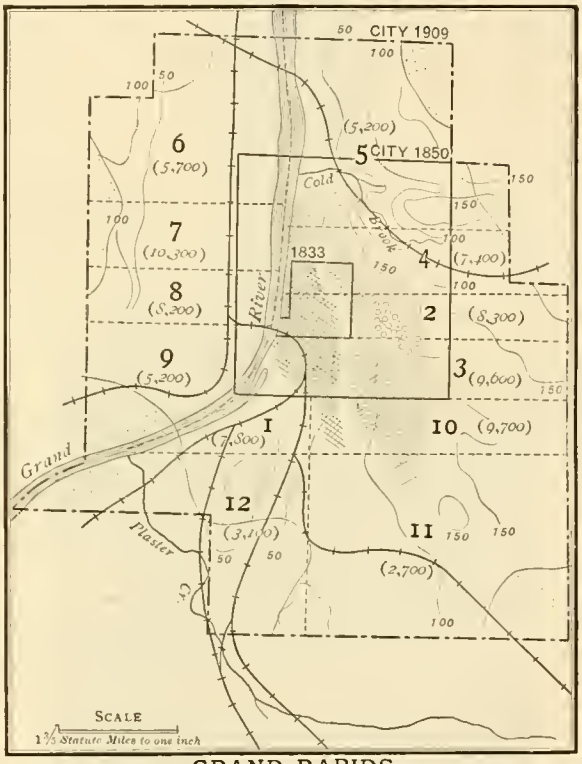


FIG. 59. *The dotted areas toward the outer boundaries of the city are still thinly built up. Within are seen the narrower limits of the city as chartered in 1850 and the village limits of 1833. The crosslined area is the business district, the single parallel lines show the residence district, the small circles designating finest houses. The continuous black lines are contours, or level lines running 50, 100, and 150 feet above the low water in the river. Wards are numbered, and in parentheses are given the number of people to the square mile in each.*

FIG. 60. *A view of the State Agricultural College at Lansing.*

Rapids' slogan, "Grand Rapids knows how," may bring a smile to the faces of citizens of would-be rival towns, yet they admit she has known how to do some things. Only in Detroit and Grand Rapids may the citizens of Michigan obtain certified milk. Almost unique in city government is Grand Rapids' contract with her manager of public works, engaged, not elected, on business qualifications, to get the city's work done for her. The city's water is taken from the Grand River, into which, of course lower down, the sewage is also discharged. The supply is plentiful and cheap, as the lawns abundantly testify. It is not satisfactory to the citizens for table use. It is probable that, before long, filtration will be resorted to and will supply water of satisfactory clearness and undoubted safety.

The gypsum mined near the city is manufactured into various forms of plaster.

Lansing, the capital of Michigan, lies on the Grand River in the fertile farming section of the south central part of the state. Beets from which beet sugar is made are grown in the vicinity. Other manufactured products are automobiles, agricultural implements, gas engines, cars, wagons, and furniture. The State Reform School, State School for the Blind, and the Michigan Agricultural College (Fig. 60) are located in and near the city.

Jackson. The business center of Jackson has moved off somewhat to the east of the old village of Jacksonburg. (Fig. 61.) The city has gentle relief, which makes its residence district in the west the more attractive. It is well supplied with railroads, and is a normal, steadily growing city of 31,000, serving a wide countryside that buys of it, and sells it farm produce. Manufacturing has had a natural development. The water supply is from twelve wells in the rock, and is abundant and clear. Analyses of the water are not made, but the low death rate from typhoid fever in the city suggests its purity. Jackson may take great credit for the scientific disposal of its sewage, which is a great safeguard to its neighbors downstream. The state prison is located here.

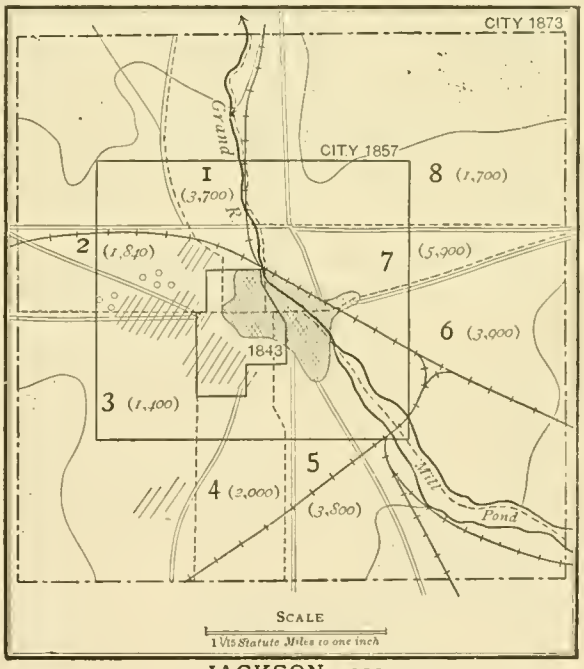
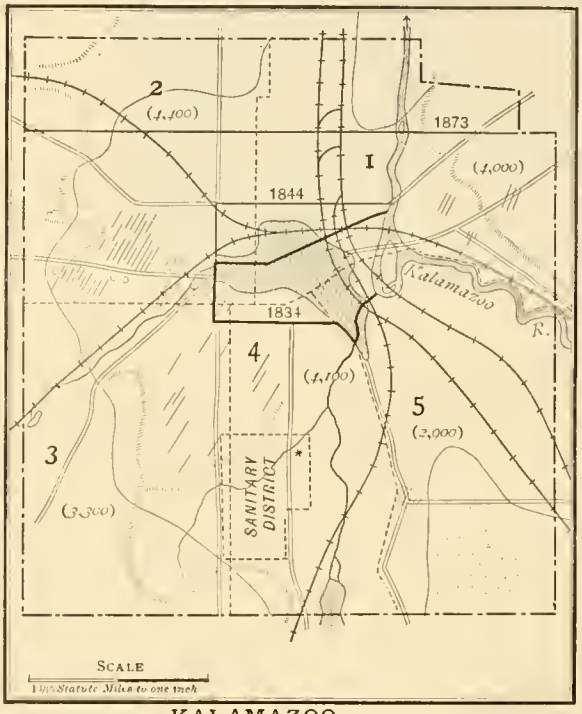


FIG. 61. *The central plat of Jacksonburg of 1843 is shown and the limits under which Jackson was incorporated a city in 1857. The business center is crosslined, and the parallel lines indicate the better residences, small circles marking the finest. The dotted areas are thinly built up. The numbers are ward numbers and people to the square mile in each.*

Jackson is about the southernmost point at which Michigan coals have been mined.

Towns of the Kalamazoo Valley. Where the bluffs that bound the valley of the Kalamazoo River on either side draw apart to twice their usual distance of about a mile, *Kalamazoo* stands (Fig. 62) on a terrace some twenty feet above the water. Here was a plat of rich, level land safe above ordinary floods, and ample for a considerable farming settlement. The Bronson of 1834 and 1844 stood wholly on this terrace of the left bank. The Kalamazoo that inherited the site has expanded across the river to the eastward. On the western bluff stand the fine buildings of the Western State Normal School, with a splendid view across the valley. Behind this is the State Asylum for the Insane, and the Kalamazoo College occupies a fine crest a little farther north. The main home of the well-to-do is the west and southwest, while business clings as usual to the earliest village site, where homes have mostly given place to stores and places of business.



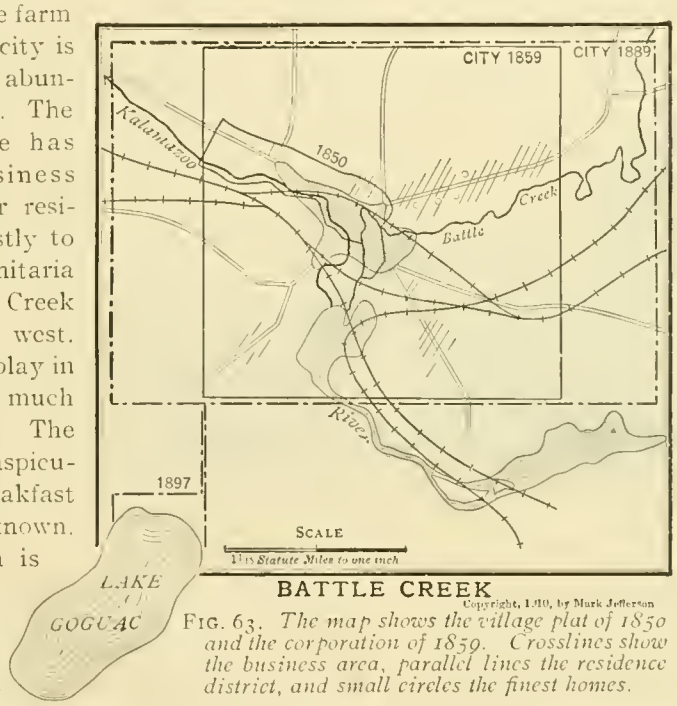
KALAMAZOO 1909

FIG. 62. *The heavy line in the middle of the map bounds Bronson, the original village of 1834. A lighter line shows the expansion northward in 1844, while a dated line at the top of the map indicates the Kalamazoo of 1873. The dotted areas near the boundaries are little built up yet. Crosslining in the center marks the business district, single parallel lines the better residences, with circles suggesting the finest. The wards are numbered, numbers in parentheses giving the density of the population per square mile. Bluffs are shown in the west and east by bands of short parallel lines.*

In the south and southwest the flood plain of Portage Creek occupies still lower ground, on which are the city wells and pumping station, shown on the map by a star. This district stands below the city sewers, and, to prevent contamination of the bright, transparent city water supply, a sanitary district has been formed where the health officer supervises the complete removal of all house wastes. No bottled water is offered for sale in Kalamazoo. The people are satisfied with their public supply. The supply is, of course, less abundant than if a river could be drawn on, but meters are put in all the houses, so that Kalamazoo uses her water economically. In 1893, before meters were put in, 787,000,000 gallons of water were pumped. In 1908 this had dropped off to 245,000,000, a saving that other cities might emulate. Lawns are doubtless less lavishly watered than in Grand Rapids and Saginaw, where nearly three times as much water is used at each tap. The health of the city is good, the death rate low, especially when we deduct the number of people from other counties that die in the asylum. Connection with the sewer is compulsory, and being made as rapidly as the work can be carried forward. The city has abundant air. Its densest population is 4,400 to the square mile. Railways radiate in every direction, giving good connections with the farm lands about and with other cities. Water power lends its aid to industry, in which the paper mills doubtless lead. It gives some idea of their importance to learn that their daily output is nineteen carloads of paper, their daily consumption of material and coal, seventy. Auxiliary industries are establishments making envelopes, paper boxes, blank books, calendars, labels, and playing cards. Vehicles are shipped daily in ten-carload lots. In all, Kalamazoo claims 9,000 industrial employees.

The streets are well kept. Bronson Park is a beauty spot. A fine public library attests the public spirit of its donors, Dr. and Mrs. V. Van Duzen.

Battle Creek. Battle Creek (Fig. 63) is situated at the junction with the Kalamazoo River of the creek that gives the city its name. The river flats are somewhat complicated here by glacial gravels, in one of whose hollows to the southwest Lake Goguac lies, and by the presence of the Marshall sandstone, which comes to the surface on the hillslope of west Main Street and other points in the city. The stone has been quarried to some extent and used for building. There is probably no other city in the Southern Peninsula with rock outcrops in its streets. It is, however, local. Round about the city the soil is deep and the farm land good. The city is openly built, with abundant light and air. The original village has become the business center. The finer residences lie off mostly to the east; the sanitaria for which Battle Creek is famous, on the west. There is little display in Battle Creek, but much business activity. The city hall is inconspicuous, but their breakfast foods are widely known. The population is about 25,000.



BATTLE CREEK

FIG. 63. *The map shows the village plat of 1850 and the corporation of 1859. Crosslines show the business area, parallel lines the residence district, and small circles the finest homes.*

The water power is used for many industries. Specialties of Battle Creek are threshing machines, traction engines, and steam pumps. Printing presses also are made, and other machines. There is good railway connection, and the city is market for a wide district of farms. Water is taken from Lake Goguac and is abundant, clear, and pure, though endangered by drainage from houses about the lake, a condition that will doubtless be removed when the city becomes conscious of its wealth. The Kalamazoo River is here becoming too small for continued use as an outlet for sewage. As the city becomes larger, here too a change will inevitably be made. Jackson, still farther upstream, has already installed filter beds.

Battle Creek is the headquarters of the Seventh Day Adventists.

Lake Michigan Towns. On the shore of Lake Michigan on Black Lake Harbor is *Holland*, a port from which the products of the near-by fruit-growing district are shipped. It also ships grain and stone from quarries in the vicinity. It has a large beet-sugar factory and also manufactures furniture. Holland is the seat of Hope College.

Thirty-eight miles north and west of Grand Rapids, near the mouth of the Muskegon River, lies *Muskegon*. The river widens out from this point to the lake and forms the finest harbor on the east shore of Lake Michigan. Besides a large lake trade it has a number of flourishing manufactories.

Manistee, a Lake Michigan port at the mouth of the Manistee River, is the center of the chief salt-producing district of the state. The river still brings logs from the interior counties, and the town is noted for the production of shingles. Among other industries are included the making of watches, shirts, and gloves. The Manistee Iron Works plant is one of the finest in the state.

At the extreme southern end of Grand Traverse Bay is *Traverse City*, with an attractive situation at the foot of fine morainic hills to the west. The town has sawmills, woodworking and other factories, and is a market for the products of the near-by farming district. An asylum for the insane is located here.

Towns of the Northern Peninsula. One of the leading lumber towns of the peninsula is *Menominee*, on Green Bay, Lake Michigan, at the mouth of the Menominee River. Great quantities of timber, rough and finished, are shipped, and there is a large wholesale trade in groceries and hardware. Varied industries,

including malleable iron and steel works, factories for making shoes, sand brick, electric specialties, paper, and beet sugar, have been established. First-class water power is being developed here. To the north of Menominee, and inland near the Menominee River, is *Iron Mountain*. It is the supply point of a large mining district, and ships large quantities of iron ore.

East of Menominee is *Escanaba*, on a great sand spit in an arm of Green Bay, Lake Michigan, one of the two great shipping ports for Michigan iron ore. The spit, projecting into the bay like the point of the letter V, shuts off Little Bay de Noc from Green Bay; so the ore piers are on the sheltered northern side, while the fine residences and a neat little park front the water on the south. Lumbering is an important interest in the surrounding area, and large shipments of lumber are made, with extensive manufactories for various articles from hard wood found near by. A large number of the people are engaged in fishing.

FIG. 64. *Locking a 500-footer through the Soo locks.*

Sault Ste. Marie, at the falls of the St. Marys River and on the famous *Soo* Canal, is a well-known town of the upper peninsula. Lying between lakes Superior and Huron, the commercial lake fleet of the United States passes through the great locks here. (Fig. 64.) Connected with Canada by a railroad bridge, at the junction of three railroad lines, and having direct water routes to all important ports on the lakes, Sault Ste. Marie commands every advantage for holding and widely increasing its importance as a trade center. At present lumbering, fishing, and manufacturing are the chief industries, but the great water power recently developed seems destined to create a much wider range of interests. Agriculture is being rapidly developed in the near-by area, and already large shipments of hay have been made to Boston by Canadian railways.

An important outlet of the Marquette and Gogebic iron-mining regions and one of the two great ore-shipping points of Michigan is *Marquette*, located on Iron Bay, Lake Superior. (Fig. 49.) Coal cargoes brought here by the returning ore carriers make the city a distributing point for the coal supply of the Upper Lake Region. Lumbering, carried on extensively in this part of the Northern Peninsula, supplies material for several lumber-working industries. Here is one of the largest charcoal furnaces in the world. The easily supplied hard wood is used for the charcoal, and wood alcohol and acetic acid are extracted from the smoke usually allowed to escape from the pits. Marquette is the seat of one of the state normal schools. The city is one of the most attractive in the region as it nestles at the foot of wooded hills among the rocks on the shore of beautiful Lake Superior.

West of Marquette lies *Ishpeming*, another of the leading cities of the Marquette iron district. Most of the timber which once covered this region has been cut, and the famous lumbering interests have given way to the development of the steadily increasing number of iron mines and to the farms that are taking the place once occupied by the timber.

In the Gogebic iron district, the extreme northwest portion of the state, is *Ironwood*, an important town of this section. The mining of iron ore is the chief interest.

Statistics of the State of Michigan by Counties, from the Federal Census of 1900 and 1910 and State Census of 1904.

COUNTY	ORGANIZATION	AREA	POPULATION		FARM PROPERTY INCLUDING LIVE STOCK	FARM PRODUCTS	MANUFACTURES	COUNTY SEAT	POPULATION	
			1910	1900					1904	1900
Alcona	1869	690	5,703	5,691	$ 999,686	$ 248,995	$ 527,134	Harrisville	461	403
Alger	1885	924	7,675	5,868	153,388	48,701	1,651,050	Munising	2,000	2,014
Allegan	1835	830	30,810	38,812	19,850,228	2,825,954	1,862,480	Allegan	2,795	2,667
Alpena	1857	584	19,065	18,254	1,830,038	471,709	2,502,191	Alpena	12,400	11,802
Antrim	1863	491	15,092	16,568	2,447,490	573,252	3,137,374	Bellaire	1,170	1,157
Arenac	1883	365	9,640	9,821	1,523,041	280,241	651,778	Standish	949	829
Baraga	1875	890	6,127	4,320	360,308	98,111	1,078,315	L'Anse	617	620
Barry	1839	572	22,033	22,514	12,571,509	2,048,212	1,462,107	Hastings	3,558	3,172
Bay	1857	437	68,238	62,378	9,016,945	1,496,587	12,192,096	*Bay City	45,166	27,628
Benzie	1869	309	10,638	9,685	1,460,816	263,230	627,886	Honor	250	.....
Berrien	1831	566	53,622	49,165	22,665,285	3,206,441	5,204,035	St. Joseph	5,322	5,155
Branch	1833	504	25,605	27,811	14,485,839	2,247,743	2,773,219	Coldwater	6,225	6,216
Calhoun	1833	697	56,638	49,315	18,729,349	2,996,369	9,308,473	Marshall	4,361	4,370
Cass	1829	500	20,624	20,876	12,803,211	1,623,430	1,774,341	Cassopolis	1,477	1,330
Charlevoix	1869	423	19,157	13,956	2,309,833	555,099	1,352,929	Charlevoix	2,395	2,079
Cheboygan	1853	785	17,872	15,516	1,929,497	499,191	2,082,497	Cheboygan	6,730	6,489
Chippewa	1827	1,580	24,472	21,338	2,150,569	515,006	3,037,971	Sault Ste. Marie	11,442	10,538
Clare	1871	575	9,240	8,360	1,198,533	260,812	593,712	Harrison	547	647
Clinton	1839	570	23,129	25,136	16,886,401	2,616,427	1,131,830	St. Johns	3,768	3,388
Crawford	1879	575	3,934	2,943	251,668	105,487	639,568	Grayling	1,282	.....
Delta	1861	1,127	30,108	23,881	1,737,452	535,444	4,171,958	Escanaba	11,098	9,540
Dickinson	1891	756	20,524	17,890	382,576	70,641	701,308	Iron Mountain	8,585	9,242
Eaton	1837	566	30,490	31,668	16,065,303	2,894,155	1,554,603	Charlotte	4,726	4,092
Emmet	1853	462	18,561	15,931	2,372,304	491,736	1,402,695	Petoskey	5,186	5,285
Genesee	1836	468	94,555	41,804	18,880,467	3,170,858	6,389,386	*Flint	38,550	13,103
Gladwin	1875	510	8,413	6,564	1,102,936	207,030	276,196	Gladwin	1,091	775
Gogebic	1887	1,152	23,333	16,738	81,554	15,783	305,529	Bessemer	3,111	3,011
Grand Traverse	1851	496	23,784	20,479	*4,346,397	863,484	1,890,144	Traverse City	11,237	9,407
Gratiot	1855	572	28,820	29,889	12,060,909	2,204,196	1,052,323	Ithaca	1,920	2,020
Hillsdale	1835	605	29,073	29,865	17,284,810	2,885,257	2,224,447	Hillsdale	4,809	4,151
Houghton	1848	1,077	88,098	66,063	922,181	254,034	21,517,808	Houghton	4,345	3,359
Huron	1859	841	34,758	34,102	13,341,896	2,340,070	1,266,016	Bad Axe	1,423	1,241
Ingham	1838	547	53,310	39,818	15,202,535	2,607,711	3,851,025	Mason	1,955	1,828
Ionia	1837	575	33,550	34,329	15,858,240	2,307,122	4,219,547	Ionia	5,222	5,209
Iosco	1857	560	9,753	10,246	1,135,325	243,241	997,715	Tawas	1,245	1,228
Iron	1885	1,143	15,164	8,090	283,529	67,171	512,271	Crystal Falls	2,081	3,321
Isabella	1859	568	23,629	22,784	7,320,876	1,338,132	760,617	Mt. Pleasant	4,484	3,662
Jackson	1832	695	53,426	48,222	18,102,132	2,874,495	8,149,969	*Jackson	31,433	25,180
Kalamazoo	1830	575	60,427	44,310	16,238,017	2,298,485	8,403,433	*Kalamazoo	39,437	24,404
Kalkaska	1871	570	8,097	7,133	1,265,685	328,020	533,021	Kalkaska	1,355	1,304
Kent	1836	862	159,145	129,714	23,908,449	3,425,825	26,540,215	*Grand Rapids	112,571	87,565
Keweenaw	1861	570	7,156	3,217	50,410	22,808	.....	Eagle River	200	.....
Lake	1871	575	4,939	4,957	1,001,068	190,904	89,272	Baldwin	486	343
Lapeer	1835	667	20,033	27,641	13,853,063	2,383,332	762,937	Lapeer	3,460	3,297
Leelanau	1863	355	10,608	10,556	3,479,103	609,419	1,026,204	Leland	350	.....
Lenawee	1827	742	47,907	48,406	25,593,766	4,005,543	4,715,277	Adrian	10,680	9,654
Livingston	1836	575	17,736	19,604	13,089,871	2,071,804	1,109,041	Howell	2,450	2,518
Luce	1887	915	4,004	2,983	249,404	78,063	441,750	Newberry	1,256	1,015
Mackinac	1818	1,146	9,249	7,703	684,261	152,485	796,306	St. Ignace	2,083	2,271
Macomb	1818	460	32,606	33,244	17,958,652	2,241,447	1,187,755	Mt. Clemens	7,108	6,576
Manistee	1855	547	20,688	27,856	2,947,126	517,898	5,958,136	Manistee	12,708	14,260
Marquette	1851	1,839	46,739	41,239	1,101,078	217,511	2,729,783	Marquette	10,665	10,058
Mason	1855	501	21,832	18,885	4,170,307	553,634	2,072,163	Ludington	7,259	7,166
Mecosta	1859	567	19,466	20,603	4,888,663	886,621	1,069,225	Big Rapids	4,852	4,686
Menominee	1863	1,044	25,648	27,046	2,854,440	579,865	6,635,883	Menominee	11,096	12,818
Midland	1855	518	14,005	14,439	3,669,118	707,087	568,045	Midland	2,520	2,363
Missaukee	1871	566	10,606	9,308	1,381,103	375,100	433,177	Lake City	724	816
Monroe	1817	572	32,917	32,754	17,094,164	2,775,428	1,304,911	Monroe	6,128	5,043
Montcalm	1850	720	32,009	32,754	10,078,569	1,746,545	1,827,077	Stanton	1,120	1,234
Montmorency	1881	561	3,755	3,234	525,738	151,248	833,073	Atlanta	85	.....
Muskegon	1850	522	40,577	37,036	5,200,906	983,606	7,438,285	Muskegon	20,897	20,818
Newaygo	1851	851	19,220	17,673	5,604,225	873,572	444,180	Newaygo	1,185	1,172
Oakland	1820	897	49,576	44,792	25,432,975	3,309,838	4,889,777	Pontiac	10,884	9,769
Oceana	1855	565	18,379	16,644	6,086,834	1,051,925	920,973	Hart	1,464	1,134
Ogemaw	1875	568	8,907	7,765	1,247,660	241,287	382,892	West Branch	1,495	1,412
Ontonagon	1852	1,355	8,650	6,197	377,124	69,684	530,755	Ontonagon	1,601	1,267
Osceola	1869	575	17,889	17,859	3,899,959	824,100	1,323,424	Hersey	315	327
Oscoda	1881	572	2,027	1,468	280,058	71,480	131,021	Mio	150	.....
Otsego	1875	520	6,552	6,175	956,249	255,978	588,122	Gaylord	1,851	1,561
Ottawa	1837	561	45,301	30,667	13,666,423	2,200,192	5,051,165	Grand Haven	5,239	4,743
Presque Isle	1871	660	11,249	8,821	1,473,431	372,438	705,808	Rogers	566	544
Roscommon	1875	535	2,274	1,787	175,897	39,393	272,200	Roscommon	407	465
Saginaw	1835	832	89,290	81,222	18,417,800	2,896,988	12,908,064	*Saginaw	50,510	42,345
St. Clair	1821	690	52,341	55,228	15,814,229	2,333,156	6,027,378	Port Huron	20,028	19,158
St. Joseph	1829	506	25,499	23,889	12,370,537	1,589,299	2,706,803	Centerville	639	645
Sanilac	1850	966	33,930	35,055	14,566,513	2,784,242	827,163	Sandusky	729	578
Schoolcraft	1871	1,151	8,681	7,889	570,252	137,881	1,902,736	Manistique	4,596	4,126
Shiawassee	1837	542	33,246	33,866	15,028,753	2,596,845	2,877,790	Corunna	1,601	1,510
Tuscola	1850	814	34,013	35,890	15,408,257	2,719,722	1,260,414	Caro	2,268	2,006
Van Buren	1837	625	33,185	33,274	16,434,647	2,437,110	1,131,984	Paw Paw	1,747	1,465
Washtenaw	1826	600	44,714	47,761	21,453,765	3,236,504	4,778,190	Ann Arbor	14,590	14,509
Wayne	1796	626	531,590	348,703	35,171,688	3,356,843	111,868,788	*Detroit	465,766	285,704
Wexford	1869	575	20,769	16,845	2,111,411	543,480	3,321,775	Cadillac	6,803	5,007

*Federal Census, 1910.

Population of Michigan, Rank of State, and Density per Square Mile, at Each Federal Census from 1810 to 1910.

YEAR	RANK OF STATE	TOTAL POPULATION	INCREASE IN TEN YEARS	PER CENT OF INCREASE	DENSITY PER SQ. MILE
1810	25	4,762	.....	.....	0.08
1820	27	8,896	4,134	86 8	0.15
1830	27	31,639	22,743	255 7	0.20
1840	23	212,267	180,628	570.9	3.70
1850	20	397,654	185,387	87.3	6 90
1860	16	749,113	351,459	88.4	13.00
1870	13	1,184,059	434,046	58.1	20.60
1880	9	1,636,937	452,878	38.2	28 50
1890	9	2,093,889	456,052	27.9	36.50
1900	9	2,420,082	327,093	15 6	42 20
1910	..	2,810,173	389,191	16.1	49.06

State or Country of Birth of Population of Michigan, Federal Census for 1900.

STATE	NUMBER	COUNTRY	NUMBER
Native to state	1,455,615	Canada	184,398
New York	150,489	Germany	125,074
Ohio	88,290	England	43,839
Pennsylvania	30,674	Holland	30,406
Indiana	29,871	Ireland	29,182
Wisconsin	22,256	Poland	28,286
Illinois	18,802	Sweden	26,956
Vermont	6,759	Finland	18,910
Massachusetts	6,515	Scotland	10,343
New Jersey	5,351	Norway	7,582
Iowa	4,866	Denmark	6,390
Minnesota	3,690	Italy	6,178
Maine	3,572	Austria	6,049
Missouri	3,183	Russia	4,138
Connecticut	3,132		
Other states and territories	40,264	Other countries	6,296
Total native born	1,879,329	Total foreign born	541,053

Population of the Leading Cities and Towns of Michigan at each Federal Census from 1850 to 1900, and State Estimates, 1904.

CITY	1904	1900	1890	1880	1870	1860	1850
†Detroit	465,766	285,704	205,876	116,340	79,577	45,619	21,019
†Grand Rapids	112,571	87,565	60,278	32,016	16,507	8,085	2,686
†Saginaw	50,510	42,345	46,322	10,525	7,460	1,699	.....
*East Saginaw	.....	.....	.....	19,016	13,225	3,001	.....
†Bay City	45,166	27,628	27,839	20,693	7,064	1,583	.....
†Kalamazoo	39,437	24,404	17,853	13,552	9,181	6,070	2,507
†Flint	38,550	13,103	9,803	8,409	5,386	2,950	1,070
†Jackson	31,433	25,180	20,798	16,105	11,447	4,799	2,363
†Lansing	31,229	16,485	13,102	8,319	5,241	3,074	1,229
†Battle Creek	25,267	18,563	13,197	7,063	5,838	.....	1,064
Muskegon	20,807	20,818	22,702	11,262	6,002	1,450	.....
Port Huron	20,028	19,158	13,543	8,883	5,973	4,371	1,584
Ann Arbor	14,599	14,509	9,431	8,061	7,363	5,097	.....
West Bay City	12,097	13,119	12,981	6,397	.....	.....	.....
Manistee	12,708	14,260	12,812	6,930	3,343	.....	.....
Alpena	12,400	11,802	11,283	6,153	.....	.....	.....
Ishpeming	11,623	13,255	11,197	6,039	.....	.....	.....
Sault Ste. Marie	11,442	10,538	5,760	1,947	.....	596	.....
Traverse City	11,237	9,407	4,838	1,897	.....	.....	.....
Escanaba	11,098	9,549	6,808	3,026	.....	.....	.....
Menominee	11,096	12,818	10,030	3,288	.....	.....	.....
Pontiac	10,884	9,760	6,200	4,509	4,867	2,575	1,681
Adrian	10,680	9,654	8,756	7,840	8,438	6,213	.....
Marquette	10,665	10,058	9,003	4,690	4,000	.....	136
Ironwood	10,019	9,705	7,745	.....	.....	.....	.....
Owosso	9,145	8,696	6,504	2,501	2,065	1,160	.....
Holland	8,966	7,790	3,045	2,620	2,319	.....	.....
Iron Mountain	8,585	9,242	8,599	.....	.....	.....	.....
Laurium	7,653	5,643	1,159	.....	.....	.....	.....
Ypsilanti	7,587	7,378	6,129	4,984	5,471	3,955	.....
Ludington	7,259	7,166	7,517	4,190	.....	.....	.....
Mount Clemens	7,108	6,576	4,748	3,057	1,768	.....	1,302
Cadillac	6,893	5,997	4,461	2,213	.....	.....	.....
Negaunee	6,797	6,935	6,078	3,931	2,559	.....	.....
Cheboygan	6,730	6,489	6,235	2,269	.....	.....	.....
Benton Harbor	6,702	6,562	3,692	1,230	661	.....	.....
Delray	6,627	4,573	.....	.....	.....	.....	.....
Coldwater	6,225	6,216	5,247	4,681	4,381	.....	.....
Monroe	6,128	5,043	5,258	4,930	5,086	3,892	2,813
Hancock	6,037	4,050	1,772	1,783	.....	.....	.....
Calumet	5,500	.....	.....	.....	.....	.....	.....

Population of the Leading Cities and Towns—*Continued.*

CITY	1904	1900	1890	1880	1870	1860	1850
Wyandotte	5,425	5,183	3,817	3,631	2,731	.....	.....
St. Joseph	5,322	5,155	3,733	2,603	.....	.....	.....
Grand Haven	5,230	4,743	5,023	4,862	3,147	.....	.....
Ionia	5,222	5,200	4,482	4,190	2,500	.....	.....
Petoskey	5,180	5,285	2,872	1,815	.....	.....	.....
Woodmere	5,034	.....	.....	.....	.....	.....	.....
Albion	4,043	4,519	3,703	2,716	.....	.....	881
Norway	4,864	4,170	.....	.....	.....	.....	.....
Big Rapids	4,852	4,686	5,303	3,552	1,237	.....	.....
Hillsdale	4,800	4,151	3,915	3,441	3,518	2,177	1,067
Charlotte	4,726	4,092	3,867	2,910	2,253	.....	.....
Niles	4,641	4,287	4,197	4,197	4,630	.....	.....
Manistique	4,596	4,126	2,940	.....	.....	.....	.....
Mount Pleasant	4,484	3,662	2,701	1,115	.....	.....	.....
Dowagiac	4,404	4,151	2,806	2,100	1,932	1,181	.....
Marshall	4,361	4,370	3,908	3,705	4,925	.....	1,972
Houghton	4,345	3,359	2,002	.....	.....	2,157	.....
Three Rivers	3,913	3,550	3,131	2,525	1,189	957	.....
Red Jacket	3,784	4,668	3,073	2,140	.....	.....	.....
St. Johns	3,768	3,388	3,127	2,370	.....	.....	.....
South Haven	3,767	4,009	1,924	1,442	1,576	308	.....
Marine City	3,762	3,829	3,268	1,673	1,240	.....	.....
Belding	3,654	3,282	1,730	562	.....	.....	.....
Hastings	3,558	3,172	2,972	2,531	1,793	.....	.....
Gladstone	3,528	3,380	1,337	.....	.....	.....	.....
Lapeer	3,460	3,297	2,753	2,911	1,772	.....	.....
Greenville	3,421	3,381	3,056	3,144	1,807	39	.....
Bessemer	3,111	3,911	2,566	.....	.....	.....	.....
Crystal Falls	2,981	3,231	.....	.....	.....	.....	.....
Allegan	2,795	2,667	2,609	2,305	2,374	.....	.....
Fenton	2,684	2,408	2,182	2,152	2,353	735	.....
St. Clair	2,664	2,543	2,353	1,923	1,700	1,530	.....
Sturgis	2,593	2,465	2,489	2,060	1,768	1,020	.....
Alma	2,566	2,047	1,055	437	402	.....	.....
Tecumseh	2,525	2,400	2,310	2,111	2,039	1,640	.....
Midland	2,520	2,363	2,277	1,529	1,160	.....	.....
St. Louis	2,503	1,989	2,246	1,975	888	.....	.....
River Rouge	2,474	1,748	.....	.....	.....	.....	.....
Boyne	2,453	912	450	.....	.....	.....	.....
Howell	2,450	2,518	2,387	2,071	.....	754	473
Grand Ledge	2,439	2,161	1,666	1,387	.....	.....	.....
Onaway	2,408	1,204	.....	.....	.....	.....	.....
Charlevoix	2,395	2,079	1,496	512	.....	.....	.....
Lake Linden	2,347	2,597	1,862	2,010	.....	.....	.....
Hudson	2,307	2,403	2,178	2,254	2,459	1,489	.....
Caro	2,268	2,006	1,701	1,282	.....	.....	.....
Eaton Rapids	2,197	2,103	1,970	1,785	1,221	581	.....
Durand	2,166	2,134	255	210	.....	.....	.....
St. Ignace	2,083	2,271	2,704	.....	.....	.....	.....
Otsego	2,045	2,073	1,626	1,000	994	.....	.....
Vassar	2,032	1,832	1,682	670	.....	.....	.....
Munising	2,000	2,014	.....	135	.....	.....	.....

*In 1890 Saginaw and East Saginaw were consolidated.
†Population figures from the Federal Census for 1910.

Value of Agricultural Products of Michigan, Federal Census of 1900 and Year Book, U. S. Dept. of Agriculture, 1908.

CROPS	RANK OF STATE	1900	1908
All crops	12	$85,095,346	.....
All cereals	13	41,819,042	.....
All vegetables	4	11,098,136	.....
All fruits	5	5,859,362	.....
Hay and forage	6	21,792,987	$34,598,000
Corn	13	17,798,011	38,609,000
Wheat	10	12,921,025	15,260,000
Oats	9	9,264,385	20,505,000
Rye	4	1,033,416	4,050,000
Buckwheat	3	306,311	527,000
Potatoes	3	6,750,342	13,572,000
Vegetables (misc.)	15	3,048,955	.....
Beans	2	2,361,020	.....
Sugar beets	2	877,481	.....
Peas	4	689,133	.....
Onions	3	345,310	.....
Clover seed	5	290,781	.....
Orchard products	5	3,675,845	.....
Small fruits and grapes	3	2,183,517	.....
Nursery products	12	338,544	.....
Wool	5	2,454,390	.....
Dairy products	7	16,903,087	.....
Eggs	9	6,104,462	.....
Honey and wax	13	230,012	.....
Maple syrup	6	73,903	

Value of Live Stock in Michigan, Federal Census of 1900 and Year Book, U. S. Dept. of Agriculture, 1908.

LIVE STOCK	RANK OF STATE	1900	1908
All domestic animals	13	$75,907,051	.....
Horses and mules	11	36,067,032	$81,734,000
Cattle	18	28,105,250	47,200,000
Sheep	9	7,162,604	8,307,000
Hogs	14	4,588,898	9,324,000
Poultry	11	4,551,045	.....
Bees	14	352,469	.....

The Leading Manufacturing Cities of Michigan and Some Facts Concerning their Industries, Federal Census of 1900 and Census Bulletin 18, 1904.*

CITY	YEAR	NUMBER OF PLANTS	NUMBER OF WAGE EARNERS	AMOUNT OF WAGES PAID	VALUE OF PRODUCT
Detroit	1904	1,363	48,879	$22,786,576	$128,761,058
	1900	2,847	45,707	18,718,081	100,892,838
Grand Rapids	1904	389	15,700	7,302,748	31,032,589
	1900	824	14,301	5,904,670	24,824,042
Kalamazoo	1904	157	5,066	2,561,948	13,141,767
	1900	268	4,203	1,617,209	8,056,908
Battle Creek	1904	120	3,389	1,885,084	12,298,244
	1900	177	2,323	1,070,034	6,753,208
Saginaw	1904	180	4,682	2,005,908	10,403,508
	1900	480	4,866	1,936,558	10,034,409
Jackson	1904	147	3,067	1,838,068	8,348,125
	1900	291	4,206	1,666,680	7,587,526
Lansing	1904	98	2,082	1,388,542	6,887,415
	1900	164	1,575	647,788	2,827,842
Muskegon	1904	70	3,078	1,211,008	6,319,441
	1900	200	3,235	1,185,697	5,097,059
Flint	1904	70	2,161	1,040,836	6,177,170
	1900	154	2,186	895,186	5,198,827
Bay City	1904	128	2,802	1,262,724	5,620,866
	1900	376	3,307	1,466,328	7,087,624
Delray	1904	20	2,502	1,301,155	5,550,008
	1900	.....	.....	.....	.....
Adrian	1904	65	1,502	625,306	4,807,426
	1900	166	1,151	490,870	2,424,678
Port Huron	1904	75	2,070	1,384,131	4,780,589
	1900	186	2,417	1,119,320	4,298,743

*Statistics for 1904 include only factory products; for previous census, all products.

Some of the Leading Industries of Michigan and the Value of their Products, from the Federal Census of 1900 and Census Bulletin 18, 1904.*

INDUSTRY	YEAR	NUMBER OF PLANTS	AMOUNT OF WAGES PAID	VALUE OF PRODUCT
Total for state	1904	7,446	$81,278,837	$429,030,778
	1900	16,807	66,467,867	356,044,082
Lumber and timber products	1904	766	13,057,977	40,569,335
	1900	1,705	11,122,030	54,290,520
Flour and grist mill products	1904	405	766,690	26,512,027
	1900	765	718,499	23,503,901
Foundry and machine shop products	1904	382	6,412,453	22,427,265
	1900	364	6,527,466	20,615,864
Copper, smelting and refining	1904	3	454,043	21,222,217
	1900	3	364,647	17,340,041
Furniture, factory product	1904	134	5,038,312	18,421,735
	1900	124	4,570,713	14,614,506
Lumber, planing mill products, including sash, doors, and blinds	1904	246	2,365,030	14,375,467
	1900	235	2,012,754	12,460,532
Cars, steam railroad, not including operations of railroad companies	1904	4	2,200,077	13,467,751
	1900	4	1,400,580	9,920,780
Carriages and wagons	1904	183	2,246,493	12,101,170
	1900	209	2,028,530	11,205,002
Tobacco—chewing, smoking; snuff, cigars and cigarets	1904	706	2,467,116	11,863,959
	1900	608	1,769,055	9,335,027
Printing and publishing	1904	910	2,672,700	10,802,067
	1900	792	1,978,631	7,484,770
Leather, tanned, curried and finished	1904	25	865,673	9,340,349
	1900	27	550,142	6,015,590
Chemicals	1904	14	1,848,114	8,057,168
	1900	51	1,162,634	5,364,724
Druggists' preparations	1904	20	820,221	8,797,911
	1900	10	546,258	4,921,913

Some of the Leading Industries—*Continued.*

INDUSTRY	YEAR	NUMBER OF PLANTS	AMOUNT OF WAGES PAID	VALUE OF PRODUCT
Agricultural implements	1904	42	$1,685,677	$8,710,719
	1900	50	952,636	6,330,508
Butter, cheese and condensed milk	1904	371	432,302	8,209,706
	1900	286	222,245	3,018,095
Clothing, factory made	1904	82	1,201,360	7,467,393
	1900	71	893,269	5,184,181
Paper and wood pulp	1904	30	1,306,112	7,340,631
	1900	27	700,862	4,217,860
Iron and steel	1904	15	1,018,090	7,140,652
	1900	10	941,091	5,002,058
Bread and other bakery products	1904	614	1,031,807	7,115,648
	1900	455	584,005	4,008,128
Stoves and furnaces, not including gas and oil stoves	1904	21	2,283,705	7,112,874
	1900	...	.....	.....
Malt liquors	1904	86	864,115	6,090,251
	1900	77	599,310	5,296,825
Automobiles	1904	22	970,895	6,876,708
	1900	...	.....	.....
Food preparations	1904	55	459,526	6,753,690
	1900	25	143,257	1,891,516
Beet sugar	1904	10	581,074	5,378,004
	1900	9	216,704	1,602,266
Cars and general shop construction and repairs by steam railroad companies	1904	34	2,496,047	5,369,391
	1900	42	2,026,000	4,332,927
Slaughtering and meat packing, wholesale	1904	8	217,342	4,901,435
	1900	8	186,473	3,724,761
Gas, illuminating and heating	1904	46	575,168	3,865,805
	1900	38	293,076	1,472,737
Hosiery and knit goods	1904	38	769,247	3,623,885
	1900	32	580,129	2,701,257
Boots and shoes, factory product	1904	23	681,362	3,531,028
	1900	13	386,074	1,915,179
Wirework, including wire rope and cable	1904	30	392,309	3,459,024
	1900	31	237,587	1,394,464
Brass castings and brass finishings	1904	30	755,881	3,145,917
	1900	23	358,959	1,730,273
Shipbuilding	1904	57	1,068,253	2,972,865
	1900	54	1,343,887	4,432,101
Woodenware	1904	34	736,119	2,966,225
	1900	11	75,263	209,489
Paints	1904	11	222,966	2,823,933
	1900	13	120,690	1,826,742
Carriage and wagon materials	1904	35	806,653	2,788,287
	1900	24	498,925	1,767,208
Cement	1904	13	668,704	2,559,551
	1900	...	.....	.....
Salt	1904	41	626,026	2,404,717
	1900	53	619,383	2,460,538
Steam fittings and heating apparatus	1904	7	692,992	2,329,015
	1900	13	616,383	2,115,766
Structural ironwork	1904	12	496,812	2,295,860
	1900	...	.....	.....
Boxes, wooden packing	1904	46	571,704	2,272,621
	1900	46	388,683	2,287,495
Refrigerators	1904	8	529,927	2,079,817
	1900	9	314,280	1,425,876

*Statistics for 1904 include only factory products; for previous census, all products.

The Principal Items of Michigan's Wealth, United States Bureau of Statistics, 1900-1904.

	1900	1904
(a) Real property and improvements	$1,618,826,250	$2,019,296,400
Live stock	87,054,155	123,265,031
Farm implements and machinery	28,795,380	31,363,928
Manufacturing machinery, tools, and implements	68,117,259	87,255,370
Gold and silver. Coin and bullion	46,540,881	52,261,341
(b) Railroads and their equipment	237,655,000	277,597,000
Street railways, waterworks, shipping, etc	106,625,052	131,580,197
(c) Personal and other property	460,666,637	550,700,760
Total	$2,054,281,523	$3,282,410,117

(a) Exclusive of railroad and other property which in certain states is classed as "real," but in the census estimate wealth is referred to as "personal and other."

(b) Including telegraph and telephone systems electric light and power stations, Pullman and private cars, and canals.

(c) Including products of agriculture manufactures and mining, imported merchandise, clothing and personal adornments, furniture, carriages, and other kindred property.

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The figures inclosed in parentheses refer to illustrations, all other figures refer to pages.